GALEN:

TWO BIBLIOGRAPHICAL DEMONSTRATIONS

IN THE

Library of the Faculty of Physicians and Surgeons of Glasgow, 9th December, 1891, and 30th March, 1893.

BY

JAMES FINLAYSON, M.D.,

PHYSICIAN TO THE GLASGOW WESTERN INFIRMARY, AND TO THE ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW; HONORARY LIBRARIAN TO THE FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW;
ETC.

GLASGOW:
PRINTED BY ALEX. MACDOUGALL, 68 MITCHELL STREET.
1895.

PREFATORY NOTE.

—o—

Two "Bibliographical Demonstrations" of the writings of Galen have been combined, and the substance of them printed in this pamphlet.

The first was reported in the *British Medical Journal* of 12th March, 1892 (pp. 573, 730, 771); the second has not been published till now.

Various friends and correspondents kindly indicated, after the first was published, further points which seemed worthy of notice. In particular, the late Dr. W. A. Greenhill was good enough to express approval of the quotations I had selected, and to indicate a desire for more. He gave me some references which I have utilised.

Galen is so inaccessible to English readers that it is difficult to learn about him at first hand. These "Bibliographical Demonstrations," given in a library, by exhibiting the various editions of an author, and by reading selected extracts, are attempts to afford to those present some slight personal knowledge of the writer's works; however fragmentary, this may make a more vivid impression than elaborate explanations and disquisitions about an author one has never read even in part.

In this printed form, the same idea is kept in view—allowing Galen himself to show something of his work, ideas, and personality.

2 Woodside Place,
Glasgow, *November*, *1895*.

GALEN:

TWO BIBLIOGRAPHICAL DEMONSTRATIONS.[1]

—o—

At a former bibliographical demonstration I showed you, in the various editions we possess in this library, the works of

[1] The following have been found specially useful:—Dr. W. A. Greenhill, Art. "Galenus" in Smith's *Dictionary of Greek and Roman Biography*, vol. ii (London, 1870); M. Laboulbène, "Histoire de Galien, sa vie, ses œuvres, son dernier traducteur, Charles Daremberg," *Gazette des Hôpitaux*, pp. 1,041-1,188 (Paris, 1882); Dr. T. K. Chambers, "The Bloodletting Question in Olden Times," *British and Foreign Medico-Chirurgical Review*, vol. xxii (London, 1858); Dr. J. Kidd, "A Cursory Analysis of the Works of Galen, so far as they relate to Anatomy and Physiology," *Transactions of the Provincial Medical and Surgical Association*, vol. vi (London, 1837), also his Bridgewater Treatise, *On the Adaptation of External Nature to the Physical Condition of Man* (London, 1833); Dr. R. Gasquet, "The Practical Medicine of Galen and his Time," *British and Foreign Medico-Chirurgical Review*, vol. xl (London, 1867); Dr. G. J. Fisher, "Claudius Galenus," *Annals of Anatomy and Surgery*, September-December, 1881; Puschmann (Th.), *A History of Medical Education*, translated and edited by Evan H. Hare (London, 1891); Berendes (J.), *Die Pharmacie bei den alten Culturvölkern*, 2 vols. (Halle, 1891); "Discovery of the Nine Missing Books of Galen's Principal Anatomical Work," *London Medical Gazette*, session 1844-45, vol. i, p. 329; Review of "Galen on the Hand" (without name of author or publisher), in *Medico-Chirurgical Review* (London, April, 1844, p. 453).

Works on the History of Medicine and on Medical Biography should also be consulted by those desiring to study the life and works of Galen, such as Le Clerc (D.), *Histoire de la Médecine* (Amst., 1723).

Clinton (H. F.), *Fasti Romani*, 2 vols., containing most important extracts from Galen (Oxford, 1845-50).

I am indebted to Mr. Duncan, our Librarian at the Faculty, for

Hippocrates,[2] who is often styled the "Father of Medicine." To-night we have on the table before us the works of Galen, who is sometimes termed the "Prince of Physicians." His name is given in various languages as ΓΑΛΗΝΟΣ, GALENUS, GALEN, GALIEN. The chronology of Galen's life will be dealt with subsequently, but the following dates may serve to bring his period more clearly before the mind:—

Hippocrates, B.C. 460-357.
Herophilus and Erasistratus, B.C. 300.
Celsus, the medical writer, about the Christian era.
Claudius Galen, born A.D. 130, died about A.D. 200.
Lucian (the Greek writer of *Dialogues*, &c.), born about A.D. 120, died about A.D. 200.
The Emperor Marcus Aurelius, to whom Galen was physician, reigned A.D. 161-180.
Polycarp (the Christian martyr), died between A.D. 168-175.

Pergamum—"Satan's Throne" there.

Galen was born at Pergamum,[3] and so the adjective "Pergamenus" or "Pergamensis" is often affixed to his name—for example, in Linacre's Latin translation of one of his works printed in Cambridge in 1521. We know that Pergamum was a great medical centre, for it was the seat of an important temple dedicated to the god of healing; we also know that a large statue of Æsculapius, with the figure of a serpent, was a prominent feature of this building. I have not been able to find any representation of this particular statue, but the illustration of a statue of Æsculapius in Pettigrew's *Biographical Memoirs*, vol. i (London, 1838-40), may serve to

writing out some translations for me from the Latin version in Kühn's edition of Galen's works; also to Dr. Barclay Ness for writing out some translations, and especially for comparing and translating for me the passages quoted by Clinton bearing on the chronology of Galen's life.

All references, unless otherwise stated, are to Kühn's edition of Galen, in 20 volumes.

[2] See *Glasgow Medical Journal*, April, 1892.

[3] "In patria mea Pergamo," Kühn, tom. xii, p. 272.

indicate the prominence given to the serpent in such representations of this god. This figure of the serpent at the temple in Pergamum has been generally supposed by writers on the history of medicine to afford an explanation of the reference to Satan in the message to the Church at Pergamum in the Book of Revelation (ii, 13); the words (in the Revised Version), "where Satan's throne is," and "where Satan dwelleth," being understood as referring to the image of this serpent on the great temple there. In another chapter we find a similar association of ideas in the phrases "that old Serpent called the Devil and Satan" (xii, 9); and again, "that old Serpent which is the Devil and Satan" (xx, 2).

Æsculapius with his serpent was undoubtedly a leading divinity in Pergamum, although there were temples there to other deities also; moreover, it seems certain that Pergamum was regarded as one of the principal seats of this god; both of these relationships are indicated by Æsculapius being named "Pergameus Deus." Biblical critics, however, are not quite clear that this reference to "Satan's throne" is indubitably applicable to the serpent on the temple there, although it would seem that no better interpretation is available (see art. "Pergamos" in Smith's *Dictionary of the Bible*[4]).

Galen and Christianity.

This allusion to Pergamum in the Book of Revelation leads one to ask what opinion, if any, did a learned and acute man like Galen express regarding the growing body of Christians, who were then beginning to influence the history of the world? In the Life of Galen prefixed to Kühn's edition I find two references to the Christians.[5] The first is found to

[4] Prof. Percy Gardner of Oxford informs me that some German authorities "think now that *Satan's throne* at Pergamum was the vast and magnificent altar, with giants and gods in relief, recently dug up and taken to Berlin."

[5] The writer there says—"Acerrimus est Galenus contra Christianos et Judaeos eisque succenset, quod legibus nullâ earum demonstratione factâ obtemperant" (Kühn, tom. i, p. xlii).

occur in the treatise *De Pulsuum Differentiis*, lib. ii, where in the course of an argument he says—

"Unless one, from the very outset, were to imitate the school of Moses and Christ, and listen to principles laid down without any demonstration, and that too when it is least becoming to do so" (Kühn, tom. viii, p. 579).

The idea in the other reference (in the same treatise) is somewhat different; it refers to the tenacity with which the Jews and Christians held to their principles. In resenting the obstinacy with which his opponents in argument refuse to admit his conclusions, he says—

"For sooner would the disciples of Moses and Christ depart from their own system than those who have been given over to sects, and been constituted philosophers and physicians" (lib. iii; Kühn, tom. viii, p. 657).

Another passage has been quoted from Galen by his Arabian biographer Abu-l-Faraj.[6] The passage is stated by him to be from a commentary by Galen (now lost) on Plato's *Republic*. It occurs in a beautiful volume, a copy of which was presented to our University by the King of Spain—Casiri: *Bibliotheca Arabico-Hispana Escurialensis:* Matriti, 1760; tomus prior, p. 253. The following is a translation from the Latin rendering there:—

"We have known that that sect, called Christians, founded their religion on parables and miracles. We believe, moreover, that they are very little behind the philosophers in moral discipline; that they practise celibacy, that even many of their women do so; that they prefer abstemiousness in food and drink; that they are assiduous in fastings and in prayers; that they injure no one; so that they far

---

[6] Aboul Faradj (Gregory) or Abulfeda, often called "Pharajius" and "Bar-Hebraeus," lived in the thirteenth century; he was a "Jacobite Christian." See *Dictionnaire des Sciences Médicales: Biographie Médicale* (Paris, 1820); also, Leclerc (Lucien), *Histoire de la Médecine Arabe*, tome i (Paris, 1876), p. 191.

surpass the philosophers both in their endeavours after virtue and in their exercise of it. We view with admiration their pre-eminent excellence in equity, in moral probity, in chastity, and in the true accomplishing of miracles."

This passage is quoted from Abulfeda, by Professor Harnack, in a recent book (*Medicinisches aus der ältesten Kirchengeschichte*, Leipzig, 1892, S. (5) 41), and he says that he sees no reason to doubt its authenticity.[7]

But it is almost equally interesting, and in a sense more important, to consider the view entertained of Galen by the early Christians, as this was probably responsible, in some measure, for the overwhelming authority ascribed for many centuries to this medical writer. The following extract from Professor Harnack's work just quoted, is in the section on "Christian Disciples of Galen in Rome":—

"In the year 200 there was, within the Catholic Church, a school which gave itself up ardently to the study of the Aristotelian

---

[7] The following is the passage in full from the Latin translation of Abulfeda:—*Historia Anteislamica, Arabice*, Fleischer's Edition, Lips., 1831, p. 109. "Hominum plerique orationem demonstrativam continuam mente assequi nequeunt: quare indigent ut instituantur parabolis (narrationes dicit de præmiis et pœnis in vita futura exspectandis). Veluti nostro tempore videmus, homines illos, qui Christiani vocantur, fidem suam e parabolis petuisse. Hi tamen interdum talia faciunt qualia qui vere philosophantur. Nam quod mortem contemnunt, id quidem omnes ante oculos habemus: item quod verecundia quadam ducti ab usu rerum venerearum abhorrent. Sunt etiam inter eos, et fœminæ et viri, qui per totam vitam a concubitu abstinuerint: sunt etiam qui, in animis regendis coercendisque et in acerrimo honestatis studio eo progressi sint, ut nihil cedant vere philosophantibus. Hæc Galenus."

In *Historia Compendiosa Dynastiarum, Authore Gregorio Abul-Pharajio, Malatiensi Medico*, edited by Ed. Pocock (Oxon., 1663), p. 78, we find almost the same words quoted from Galen, but referred to his commentary on the *Phaedo* instead of the *Republic*: "Ait etiam in explicatione suâ libri *Platonis* de moribus cui titulus *Phaedo*, Videbis populum istum qui *Christiani* appellantur, disciplinam suam ænigmatibus et miraculis superstruxisse, neque philosophis veris operibus cedere, continentiam amare, in jejuniis et orationibus continuos esse, ab injuriis abstinere atque esse inter ipsos homines qui se mulieribus non polluunt."

philosophy, geometry, and physics: but they met with vehement opposition from the bishop and the majority of the community, and were finally excommunicated. There is still in existence the remains of a very coarse and spiteful piece of controversial writing against it, dating from the beginning of the 3rd century (Eusebius, lib. v, cap. 28). It runs thus:—*They give themselves up to the study of geometry like people who are of the earth and who talk of the earth . . . Euclid, with his geometry is by some of them highly esteemed; Aristotle and Theophrastus are held in admiration; Galen, by some among them, may even be worshipped.* The hateful exaggeration of the old Roman inquisitor, who wrote this accusation, is quite evident. What here interests us is the fact that Galen, about the year 200, found eager readers and admirers among the Christians of Rome also: one of these admirers was named Asklepiodotus."

Galen as a Teleologist—Galen's Hymn.

Probably one important reason why Galen was looked upon with so much favour by Christian writers, was the strong position he took up regarding the evidence of design in the animal creation, and the proofs which he adduced, again and again, of the Creator's purpose in forming different classes of animals exactly as they are found, and in framing the different organs in man himself for the special uses which they severally subserve.

So important, indeed, are Galen's contributions to this subject, that they occupy a considerable portion of the early part of Dr. Kidd's *Bridgewater Treatise* (1833), and some of his translations are utilised in the following extracts. The reverence shown in a celebrated passage, here also quoted, where he speaks of composing his argument "as a sincere hymn to the praise and honour of the Creator," emanating as it does from a pagan writer, has often been admired by Christian authors.

[*Relationship of various parts of the body to the sentient principle. —The Hand.*]—"But all these parts of the body were made for the use of the soul, that sentient and intelligent principle which

animates the body, and of which the body is merely the organ ; and on this account the component parts of animals differ according to the nature of this principle ; for some animals are bold and fierce, others are timid and gentle ; some are gregarious, and co-operate for their mutual sustenance and defence ; others are solitary, and avoid the society of their fellows ; but all have a form or body accommodated to their natural dispositions and habits. Thus the lion has powerful fangs and claws ; the hare has swiftness of foot, but in other points is defenceless. And the fitness of this arrangement is obvious ; for those weapons with which the lion is furnished are as appropriate to his nature as they would be useless to the timid hare ; whose safety, depending entirely on flight, requires that swiftness of foot for which she is so remarkable."

"But to man, the only animal that partakes of divine intelligence, the Creator has given in lieu of every other natural weapon or organ of defence, that instrument, *the hand;* an instrument applicable to every art and occasion, as well of peace as of war. Man, therefore, wants not a hoof or horn, or any other natural weapon ; inasmuch as he is able with his hand to grasp a much more effective weapon, the sword or spear. Besides which, natural weapons can be employed only in close conflict ; while some of the weapons employed by man, as javelins or arrows, are even more effectual at a distance. And, again, though man be inferior to the lion in swiftness, yet by his dexterity and skill he breaks in to his use a swifter animal, the horse ; mounted on whose back he can escape from or pursue the lion, or attack him at every advantage. He is enabled, moreover, by means of this instrument to clothe himself with armour of various kinds, or to entrench himself within camps or fenced cities. Whereas, were his hands encumbered with any natural armour, he would be unable to employ them for the fabrication of those instruments and means, which give him such a decided advantage over all the other animals of creation."

"Nor have we yet enumerated the most important of those privileges which the hand imparts to man. With this, he weaves the garment that protects him from the summer's heat or winter's cold ; with this, he forms the various furniture of nets and snares which give him dominion over the inhabitants as well of the water as of the air and earth ; with his hand, he constructs the lyre and lute, and the numerous instruments employed in the several arts of life ; with

the hand, he erects altars and shrines to the immortal gods; and, lastly, by means of the same instrument, he bequeaths to posterity, in writing, the intellectual treasures of his own divine imagination; and hence we, who are living at this day, are enabled to hold converse with Plato and Aristotle, and all the venerable sages of antiquity."—(Kidd's translation, *Bridgewater Treatise*, pp. 30-32. Compare Daremberg's Galien, *De l'utilité des parties*, i, 2; tome i, p. 111.)

[*The Hand.*]—"It appears to be the best constructed of all prehensile organs. Forasmuch as the hand can form a circle round a sphere, grasping it on every side, it also as securely and firmly holds the straight and the concave, which, if it be so, it can grasp all forms, for they are all formed from three figures—convex, concave, and straight. But, since many bodies are too bulky for one hand, nature has given a second, an auxiliary to the other, that each grasping opposite sides, should not hold it less securely than one very large hand. For this reason they are placed opposite each other (for they are formed for mutual use), and are in every respect equal, for they are the same organs and have similar duties. Consider the largest body a man can grasp with both hands, as a tree or a stone; and again, the smallest thing perceptible, as a grain, a hair, or a thorn; and then how great a number of bodies intervening between the largest and the smallest. You will find man grasping all these, as if the hand had been formed for each. Man seizes the least bodies with the tips of two fingers, the index and the thumb (which we Greeks call *megan*); and bodies a little larger with the thumb and the same finger, but not with the tips; for bodies still larger he employs three—viz., the fore, the middle, and the thumb; and if the body be still greater, he uses three fingers and the thumb, then all four with the thumb; afterwards he seizes with the whole hand; and finally, he seizes with both hands. It would have been impossible to perform any of these actions if the hand had not been divided; for suppose the thumb had not been placed opposite the four fingers, but all five placed in the same line, is it not plain the number would have been useless? For to grasp securely, it is necessary either that the whole body be encircled on every side, or wholly grasped on the two opposite sides. This power could not have existed if all the fingers had been placed

in the same straight line."—(Translation by an unknown author, quoted in *Medico-Chirurgical Review*, April, 1844, pp. 453-454; Daremberg's Galien, *De l'utilité des parties*, i, 5; tome i, pp. 118-119.)

[*Teeth and Talons.*]—"How does it happen that the teeth and talons of the leopard and the lion should be similar; as also the teeth and hoofs of the sheep and goat; that in animals which are by nature courageous there should be found sharp and strong weapons, which are never found in those animals that are by nature timid; or lastly, that in no animal do we meet with a combination of powerful talons with inoffensive teeth? How should this happen, but that they are the work of a Creator who ever kept in mind the use and mutual relation of different organs, and the final purpose of all His works?"—(Kidd's Translation, *Bridgewater Treatise*, pp. 42-43; Kühn, t. iii, p. 875, lines 3-17, and p. 892, lines 12-17; *De usu partium*, xi, 8, 11.)

[*Chance or Design?*]—"How can a man of any intelligence refer all this to chance as its cause; or if he deny this to be the effect of foresight and skill, I would ask, What is there that foresight and skill do effect? For surely where chance or fortune act we see not this correspondence and regularity of parts. I am not very solicitous about terms; but if you choose to call that chance which has so nicely constructed and so justly distributed all the parts of an animal body, do so; only remember, and allow that in so doing, you do not fairly exercise the privilege of framing new terms; for in this way you may call the meridian splendour of the sun by the name of night; and the sun itself, darkness. What! Was it chance that made the skin give way so as to produce a mouth? or if this happened by chance, did chance also place teeth and a tongue within that mouth? For, if so, why should there not be teeth and a tongue in the nostrils or in the ear? . . . Did chance dispose the teeth themselves in their present order, which if it were any other than it is, what would be the consequence? If, for instance, the incisors and canine teeth had occupied the back part of the mouth, and the molar or grinding teeth had occupied the front, what use could we have made of either? Shall we then admire the skill of him who disposes a chorus of thirty-two men in just order; and can we deny the skill of the Creator in disposing the same

number of teeth in an order so convenient, so necessary even for our existence?"—(Kidd's Translation, *Bridgewater Treatise*, pp. 41-42; Daremberg's Galien, *De l'utilité des parties*, xi, 7, 8; tome i, pp. 665-668.)

[*Design argued from the Hand.*]—"Whoever admires not the skill and contrivance of nature, must either be deficient in intellect, or must have some private motive which withholds him from expressing his admiration. He must be deficient in intellect if he do not perceive that the human hand possesses all those qualifications which it is desirable it should possess, or if he think that it might have had a form and construction preferable to that which it has; or he must be prejudiced, by having imbibed some wretched opinions, consistently with which he could not allow that contrivance is observable in the works of nature."

"Such persons we are bound to pity as being originally infatuated with respect to so main a point, while at the same time it behoves us to proceed in the instruction of those happier individuals, who are not only possessed of a sound intellect, but of a love of truth."—(Kidd's Translation, *Bridgewater Treatise*, pp. 39-40; Daremberg's Galien, *De l'utilité des parties*, iii, 10; tome i, p. 250.)

[*Galen's Work Composed as a Hymn to the Creator.*]—"But if I waste more time on such profligates, virtuous men might justly accuse me of polluting this sacred argument, which I have composed as a sincere hymn to the praise and honour of the Creator; being persuaded that true piety to Him consists, not in the sacrifice of whole hecatombs of oxen, nor in the offer of a thousand varieties of incense, but in believing within ourselves, and in declaring to others, how great He is in wisdom, power, and goodness."—(Kidd's Translation, *Bridgewater Treatise*, p. 40, note; Daremberg's Galien, *De l'utilité des parties*, iii, 10; tome i, p. 260.)

Galen as a Philosopher.

Galen, we must remember, was a philosopher as well as a physician. Medicine, indeed, had for centuries been regarded as a part of philosophy, and as such it comes in for some share

of attention in Plato's Dialogues.[8] Hippocrates was credited with having effected the separation of medicine as a distinct department of human knowledge, but the separation was only partial, and Galen himself entitles one of his treatises "Quod optimus medicus sit quoque philosophus." He wrote many philosophical works, and his name is perpetuated in Logic in connection with the fourth figure of the syllogism. Some doubt has indeed been expressed as to his being the inventor of this figure, but M. Daremberg says that it is certain that it occurs in Galen's *Introductio Logica.*[9]

Galen's introduction to philosophy seems to have begun with his earliest years; although we find in the chronology of his life that he studied and even wrote on Logic when only 15, it is clear that his philosophical education was begun still earlier, in the family circle, where his father, Nicon, the architect,[10] seems to have inculcated many admirable doctrines; from the following extract, it would appear that he had opportunities of illustrating his philosophy, practically, in his own home, teaching his son not only by precept but also by example.

[*Galen's account of the difference between his parents.*]—"It was my rare good fortune to have a father who was most gentle, most just, most upright, and most cultured, while my mother was so passionate that she kept scolding the maidservants, was always screaming at the pitch of her voice, and quarrelling with my father

---

[8] See a paper by Dr. Wm. Osler: "Physic and Physicians as depicted by Plato" (Boston, 1893).

[9] Daremberg "Essai sur Galien considéré comme philosophe," Paris, 1847 (Extrait de la *Gazette Médicale de Paris*). "Grâce à la découverte de M. Mynas signalée plus haut, nous savons maintenant que Galien mentionne véritablement cette quatrième espèce de syllogisme dans l'Introduction Dialectique." A footnote refers to *Introductio Logica:* "Ouvrage récemment découvert au Mont Athos et publié par M. Mynas, Paris, 1844."

[10] *De succorum bonitate et vitio*, cap. i: "Ego sane patrem habui qui ad summum geometriæ, architecturæ, logistices, arithmetices atque astronomiæ pervenit."

worse than Xanthippe with Socrates. When, therefore, I contrast the noble deeds of my father with the base tendencies of my mother, I am disposed to cultivate and love the former, and to avoid and hate the latter. Just as in all these respects, then, I discerned an enormous difference between my parents, so I noted it in this specially, that my father was put about by no inconvenience, however serious, while my mother was worried by the slightest trifle. Perhaps you, too, know that boys imitate those things to which they incline, and avoid those which seem to them unpleasing. This, then, was the method of my father's upbringing."—(Kühn, tom. v, pp. 40, 41, *De propriorum animi cujusque affectuum dignotione et curatione*, cap. viii.)

The tenor of Galen's philosophy may be gathered from the following passage, where the absolute character of Stoical doctrines seems toned down a little in their actual application to human life and experience.

[*Galen's attitude to Philosophy.*]—"Indeed, among philosophers it is freely admitted that these things are worthy of imitation, and ought to be imitated by him who wishes to increase his knowledge and enrich his mind, as well as by him who strives after justice, moderation, courage, and prudence.

"For all men extol these virtues, although they are well aware that they themselves possess none of them; they only try to *appear* to others courageous, moderate, just, and prudent. In reality, they are not free from mental vexation, but only appear so.

"Henceforth, one must take heed of this, in the first place, that to all men there is in zeal something more than virtue.

"These precepts given me by my father I have retained to this day, professing to belong to no sect, though with much care I have studied their views thoroughly, and I remain unfrightened by the chances and dangers of life just as I saw my father.

"Therefore, no loss, unless it were the loss of all I possess, could ever bring me sorrow, for this I have never yet experienced.

"My father accustomed me to despise honour and glory, and to consider virtue alone great.

"Some, indeed, we see distressed when they think themselves disgraced by another, or when they have lost their goods. From

any cause of this kind you have never seen me in distress, though up till now we have never suffered such loss as prevented us, with what remained, preserving the health of the body; nor have I sustained such dishonour as to throw the mind from the seat of reason.

"Moreover, if I hear men blame me or praise me, I shun them; and think that all who long for praise are like those who wish to possess all things. Yet I seem to myself, and perchance to you also, to have passed through life without trouble or pain. Indeed, I have not yet been stripped of all my riches nor suffered dishonour."—(Kühn, tom. v, pp. 42-44, *De propriorum animi cujusque affectuum dignotione et curatione*, cap. viii.)

In Clinton's second volume of *Fasti Romani*,[11] will be found a long list of Galen's philological, grammatical, and philosophical treatises—124 titles in all—which may serve to give an estimate of his claims to rank as a philosopher as well as a physician—ἄριστος ἰατρὸς καί φιλόσοφος.

As Galen has been accused, possibly not without reason, of arrogance and vanity, and as his disciples, up till the time of Vesalius, refused to admit that he could err even in human anatomy, it is perhaps only fair to quote a sentence from his writings which shows the modesty of the true philosopher.

[*Errare est humanum.*]—"It is difficult for a mere man to avoid making many blunders, some from sheer ignorance, others from fault of judgment, and others from carelessness."—(Kühn, tom. xii, p. 535, *De compos. med. secundum locos*, lib. iii, cap. i.)

Galen was evidently a man of great natural ability, versed in philosophy, an expert anatomist, an experimental physiologist, and a physician of great experience. He was also a writer of enormous industry, as the portions of his works which have survived, now placed on the table, may show you at a glance; but further, his writings extend over such a wide range in medicine as to be of an encyclopædic character, the whole welded together into a consistent system by a master

[11] Appendix C. 7, No. 146, p. 289. Compare also Kühn's edition of Galen, tom. xix, pp. 41-48.

mind. To this we may add that, for reasons already indicated, he was specially favoured by the authorities of the Church. No wonder, therefore, that Galen's name held an undisputed sway till Paracelsus attempted to overthrow his authority; and indeed long after that time he was virtually regarded as infallible.

Chronology of Galen's Life.

The chronology of Galen's life, unlike that of Hippocrates, is not involved in any great doubt, as his own writings contain many references to his education and practice, and also to current events, which fix the time exactly. Important data have been published by Clinton in his *Fasti Romani*. As the dates given by him are all based on actual passages from Galen, adduced by him in support of his statements, they may be accepted with great confidence. Although, with the help of one of my late assistants, I verified nearly all these references, I have only reproduced the passages quoted in support of the date assigned for his birth, which seems to be fixed, with the greatest probability possible, for the year 130, towards the autumnal solstice. These passages are quoted as a *specimen* of Clinton's method; similar quotations are adduced by him for each date specified.

An alternative date for Galen's birth—viz., 128 A.D., rests on the authority of M. Laboulbène (quoted in the first footnote), who seems to have founded his statement on M. Goulin's researches. On trying to compare Goulin's statements with Clinton's, we are confronted with the difficulty that his data have never been published, so far as I can gather, although M. Laboulbène had, no doubt, consulted the MSS. M. P. Sue was the custodier of Goulin's MSS., and he was authorised by the family to afford to others the information therein contained.[12] Amongst other

[12] "*Memoire, Historique, Littéraire, et Critique sur la vie et sur les ouvrages tant imprimés que manuscrits de Jean Goulin, Professeur de l'Histoire de la Médecine à l'Ecole de Médecine de Paris.* Par P. Sue." Paris, An viii (see pp. 12, 91).

things, the different chronological periods of the life of Galen are said to be laid down with the greatest precision. In the absence of published details they are not available, and we can scarcely go wrong in trusting to Clinton's chronology on the very precise evidence here quoted.

Chronological Abstract.

A.D.

130. Birth of Galen. His thirty-seventh year was completed in A.D. 167 ; *confer annum* whence we may place his birth in A.D. 130, towards the autumn, within the fourteenth year of Hadrian.[13]

144. Galen, æt. 14, hears the disciples of Caius and Aspasius (tom. v, p. 41).

145. Galen, æt. 15, learns logic (tom. xix, p. 59), and even wrote a treatise on it himself (tom. xix, p. 43).

147. Galen, æt. 17, begins the study of medicine (tom. xix, p. 59). He mentioned his preceptors—Pelops and Satyrus (tom. xix, p. 57). His father was warned in a dream to set him to medicine (tom. xix, p. 59 ; tom. x, p. 609).

158. Galen, æt. 28, returns to Pergamum, after having been at Alexandria (tom. xiii, p. 599).

159. Galen, æt. 29, at Pergamum (tom. xiii, pp. 599, 600). Compare note to year 130, where it is stated he was in charge of the gladiators in Pergamum when 29 years old.

---

[13] Galen : Kühn's edition, tom. xix, pp. 14, 15 : "Cum iterum Romam veni ab impp. arcessitus. . . . Etenim et adhuc juvenis id egi, quartum annum agens et tricesimum. . . . Annos autem alios tres Romæ moratus, cum cœpisset magna pestis, ilico urbi excessi in patriam properans." That is to say, he was 34 years when he went to Rome, and remained three years ; this made him 37 years when the great pestilence appeared there. The date of this is known to be 167 A.D., so he was born 130 A.D. The autumn is fixed as the time of his birth from a passage (tom. xiii, pp. 599, 600) where he refers to his appointment in charge of the gladiators at two different periods. "Similiter et ipse a septem mensium intervallo gladiatorum curationem fidei meæ concredidit, siquidem primus autumnali solstitio, secundus vigente vere, pontificatum gessit" (p. 600). A few lines before, he says, regarding his first appointment, "Curationem mihi soli tradere, quamvis juveni adhuc, vigesimum nonum enim tum primum attingebam" (p. 599).

A.D.

162. Galen mentions his first visit to Rome, when he cured Eudemus, who was 63 years old (tom. xiv, pp. 605, 614).

164. Galen's second visit to Rome; remained three years (tom. xix, pp. 14, 15).

167. Galen mentions the pestilence (tom. xix, p. 15). He was then at the age of 37; he leaves Rome and returns to his native country (tom. xix, p. 16). He refers to the plague again a few years after (tom. iv, p. 788).

169. Galen was at Aquileia when Verus died (tom. xix, pp. 17, 18). Galen afterwards returns to Rome (tom. xiv, pp. 649, 650).

174. Galen, in absence of the Emperor (A.D. 170-174), composes many works (tom. xiv, p. 650; tom. xix, p. 19; tom. ii, p. 217).

191. Some works of Galen are lost in the fire of this year (tom. xix, p. 41; tom. xiv, p. 66). These three works therefore of Galen [Περὶ τῶν ἰδίων βιβλίων, Περὶ συνθέσεως φαρμάκων τῶν κατὰ γένη, Περὶ ἀντιδότων] were written after A.D. 191. The last, Περὶ ἀντιδότων, after A.D. 193, towards the end of the life of Galen.

193. Galen delivers lectures in the reign of Pertinax (tom. xix, p. 46). As he completed his thirty-seventh year about the autumn of 167, he is now 63.

200. Galen, according to Suidas, lived 70 years, which would place his death at A.D. 200.

Old Medical Sects—Galen's Doctrines.

It is scarcely within the scope of my present purpose to enter into a discussion of the sects existing in Galen's time, or even of Galen's doctrines; but I will quote the following short extracts, which may put these matters before you sufficiently for our present purpose. Dr. Adams, in the preface to his translation of *Paulus Æginetа*, vol. i, p. 12 (London, 1844), puts it thus:—

[*Dr. Adams on the Various Medical Sects*].—"The *Empirics* held that observation, experiment, and the application of known remedies in one case to others presumed to be of a similar nature constitute the whole art of cultivating medicine. Though their views were narrow and their information scanty when compared with some of

the chiefs of the other sects, and although they rejected as useless and unattainable all knowledge of the causes and recondite nature of diseases, it is undeniable that, besides personal experience, they freely availed themselves of historical detail and of a strict analogy founded upon observation and the resemblance of phenomena. To this class we may refer Scribonius Largus, Marcellus, Plinius Valerianus, and a few others.

"The sect called the *Rational, Logical*, or *Dogmatical*, holding that there is a certain alliance and connection among all the useful and ornamental arts, maintained that it is the duty of the physician not to neglect any collateral science or subject. They therefore inquired sedulously into the remote and proximate causes of disease, and into the effects of airs, waters, places, pursuits, food, diet, and seasons in altering the state of the human body, and in rendering it more or less susceptible of morbid changes. Looking upon general rules as not being of universal application, they held that the treatment ought to be modified according to the many incidental circumstances under which the patient might be placed. They freely and fully availed themselves of whatever aid they could derive from experience, analogy, and reasoning. Hippocrates, Galen, Aëtius, Oribasius, Paulus Ægineta, Actuarius, and all the Arabian authorities may be looked upon as belonging to this sect.

"The *Pneumatic* sect, to which Aretæus probably belonged, was nearly allied to the Dogmatical.

"The sect of the *Methodists*, rejecting altogether the consideration of remote causes, which they held to be of no importance to the cure, and giving themselves up to too bold classification of diseases, according to certain hypothetical states of the body in which they were supposed to originate, fettered themselves too much with a few general rules, which they held to be so universally applicable that they would scarcely allow of their being modified by incidental circumstances in any possible contingency. The only perfect model of ancient Methodism that has come down to us is Cælius Aurelianus. Moschion and Theodore Priscian belonged to this sect; Alexander of Tralles also had a considerable leaning to its principles, and some would even refer the illustrious Celsus to this class, but probably without good reason, for he would rather seem to have imbibed the genuine spirit of *Eclecticism*, and, like his distinguished correspondent Horace, to have been *Nullius addictus jurare in verba magistri.*"

This subject of medical sects is apt to appear somewhat confused to the modern student of medicine; but the differences of the sects have their foundation in the different constitution of different minds; they have a deeper basis than anything connected with specially medical studies or practice. This question is discussed in a comprehensive and luminous manner by Dr. Gee in an address to the Abernethian Society on "Sects in Medicine" (London, 1889), a perusal of which is recommended to those interested in such matters.

Between the time of Hippocrates and Galen a great medical school had arisen in Alexandria, about 300 B.C., which made enormous advances in anatomy and surgery, the impress of which remains to the present day. This was the school dominated by Herophilus and Erasistratus. In medicine these two great teachers had, long after their death, their respective followers—the Herophilites and the Erasistrateans—but the distinction between them need not detain us here; they were great rival schools, and divided the medical world between them. The wide reputation of Erasistratus as a practical physician, his voluminous writings, and his boldness in announcing new views, even when they contradicted Hippocrates himself, had apparently given his sect the supremacy at the time of Galen. The controversy between the two rival schools is referred to in a recently acquired "Medical Papyrus in the British Museum," an account of which is given by Mr. F. G. Kenyon in the *Classical Review* for June, 1892. The writer of this papyrus is said to lean to the Herophilites, and to be occupied in refuting the Erasistratean school, at a time, apparently, just before the appearance of Galen on the scene. It is not easy to judge of the real value of the teaching of Erasistratus,[14] whose ability and industry were so notable; but, no doubt, he had seen great abuses from the

[14] His writings are lost, and we have to derive our information chiefly from his great opponent, Galen, who wrote special books *against* Erasistratus and his disciples, and he constantly contends with them as opponents. See a paper by the author on "Herophilus and Erasistratus," *Glasgow Medical Journal*, May, 1893.

prevalent treatment by venesection, and he was led to protest forcibly against this practice, even although it was hallowed by the approval of Hippocrates himself. We find Galen constantly contending against this sect in his writings, and pouring out sarcasm and contempt on their ideas. When he succeeded in crushing them, he reigned supreme in the medical world.

As to Galen's own doctrines, the following extract from Dr. Bostock may suffice to indicate his position briefly. My present purpose is to present Galen, or rather to allow him to present himself, as an investigator and practitioner, without any elaborate doctrinal expositions:—

[*Dr. Bostock on Galen's Doctrines.*]—"In his general principles he may be considered as belonging to the Dogmatic[15] sect, for his method was to reduce all his knowledge, as acquired by the observation of facts, to general theoretical principles. These principles he, indeed, professed to deduce from experience and observation, and we have abundant proofs of his diligence in collecting experience, and his accuracy in making observations. But still, in a certain sense at least, he regards individual facts and the detail of experience as of little value, unconnected with the principles which he laid down as the basis of all medical reasoning. In this fundamental point, therefore, the method pursued by Galen appears to have been directly the reverse of that which we now consider as the correct method of scientific investigation; and yet, such is the force of natural genius, that, in most instances, he attained the ultimate object in view, although by an indirect path. He was an admirer of Hippocrates, and always speaks of him with the most profound respect, professing to act upon his principles, and to do little more than to expound his doctrines, and support them by new facts and observations. Yet in reality we have few writers whose works, both as to substance and manner, are more different from each other than

[15] According to Dr. Gee, every one must be either a Sceptic or a Dogmatic. Some, no doubt, are more definitely dogmatic than others. Even if a Sceptic alleges that he doubts, he ceases to be a Sceptic, and becomes a Dogmatic!

those of Hippocrates and Galen, the simplicity of the former being strongly contrasted with the abstruseness and refinement of the latter. . . .

"He adopts, as the foundation of his theory, the doctrine of the four elements, and, like Hippocrates, he supposes that fluids are the primary seat of disease. But in his application of this doctrine, he introduced so many minute subdivisions, and so much refined speculation, that he may be almost regarded as the inventor of the theory of the Humoralists. . . . The four elements, the four humours, and the four qualities,[16] connected in all the variety of combinations, presented a specious appearance of method and arrangement, which took such firm possession of the mind as to preclude all inquiry into the validity of the foundation. . . . The operation of medicines was reduced to their power of correcting the morbid states of the fluids, as depending upon their four primary qualities, or the various modifications of them."—(Dr. Bostock's *Sketch of the History of Medicine*, London, 1835, pp. 86-88.)

Galen as a Hippocratic Critic.

As a Hippocratic scholar, critic, and commentator, Galen had enormous advantages. Thoroughly acquainted, like his father, with the various forms of the Greek language, and saturated with the knowledge and traditions of the medical profession, he had likewise a great admiration of the author, and at the same time much practical experience to guide him in his study of the works. Some idea of the extent of Galen's commentaries may be gathered at a glance when we see five volumes of Kühn's edition—about one-fourth of the whole—taken up by the commentaries on the Hippocratic writings. In vol. xix we find a vocabulary he compiled for the Hippocratic treatises, and this, along with a similar lexicon by Erotian and by Herodotus, was published in a volume edited by Franzius, Leipzig, 1780.

Galen discusses the genuine or spurious character of the various Hippocratic treatises; he expounds the meaning of

[16] *Four elements*—fire, water, air, earth. *Four qualities*—hot, cold, moist, dry. *Four humours*—blood, phlegm, yellow bile, black bile.

the text; he criticises the statements, and he goes into long and elaborate commentaries based on his own ideas and experience. His criticism is of paramount importance; but, from the extent to which his commentaries go, they are rather treatises by Galen than commentaries on Hippocrates.

Galen as an Anatomist and Physiologist.

As an anatomist Galen takes high rank. Two anatomical treatises exist: *De Anatomicis Administrationibus*, in nine books; and the other, *De Usu Partium*, in seventeen books. This last is translated in full into French by Daremberg. Both of these works testify to the minuteness of his anatomical studies, and in them, as already shown, he discusses the adaptation of means to ends, and pursues the argument from design in the animal creation.

Of Galen's work as an anatomist and physiologist we can gather a good idea from Dr. Kidd's paper in the *Transactions of the Provincial Medical Association* (1837), already referred to in the first footnote. Lauth's *Histoire de l'Anatomie* (tome i, Strasbourg, 1815), to which Dr. Kidd refers, contains a pretty full account of Galen's anatomy, with references to the passages on which his account is founded.

Much discussion has taken place as to whether Galen practised human dissections, or limited himself entirely to the lower animals. It is quite certain that he dissected animals, and even that he performed physiological experiments on living animals.[17] He seems to have dissected a great variety of animals,[18] preferring apes, however, on account of their resemblance to the human subject. He mentions specially that those physicians who had the opportunity of examining the bodies of their enemies slain in the

[17] Kühn, tom. xix, p. 55. Dr. Greenhill informed me, after looking into the matter, "that while Galen *probably* used apes and other animals for physiological experiment, he certainly did make use of pigs."

[18] Lauth says he even dissected an elephant, p. 186 (Kühn, tom. ii, p. 619).

German war, waged by Marcus Aurelius, could make but little of their opportunities, unless they had been previously versed in the dissection of animals, and especially of the ape.[19] In the same passage he refers to stray chances of examining the bodies of young children who had been exposed, of robbers who had been slain, or of those condemned to be exposed to wild beasts. But whilst it seems plain from such remarks that human dissections were rare, although not unknown, it is equally clear, from the following extract, that Galen had the benefit of the study of human osteology. It has been already stated that Galen had been in Alexandria, and returned from there to his native country in 158 A.D. (see abstract of Chronology). Under Herophilus and Erasistratus, the Alexandrian school had attained to great eminence in anatomical studies, and we know that dissections of the human subject were practised there. Some of its ancient reputation and facilities seem to have survived in this respect, and Galen advises his pupils to go there to study anatomy, where he himself had derived benefit.

[*Study of Osteology.*]—"This, indeed, will be absolutely necessary for you, that you make yourself thoroughly acquainted with the subject, not only from a book, but with your eyes as a diligent observer of human bones; this is more easily done in Alexandria, because the physicians of that place in expounding to their pupils the science of the bones exhibit them for their inspection. I am, therefore, of opinion that you should endeavour to make a stay at Alexandria, if for no other reason than this alone. If you cannot manage to do this, you can examine human bones in the way I adopt, for I have often studied them in certain burying places or in ruinous tombs. Sometimes, also, a river having overflowed, a few months previously, some ill-built burying place, has washed out its contents, and has conveyed a whole body even the length of a

[19] "At qui in aliis animantibus et potissimum in simia prius se exercuerit promptissime singulas quæ inciduntur partes detegit" (Kühn, tom. ii, p. 385). And again: "Quemadmodum nec medici bello Germanico barbarorum corporum insectionis potestatem habentes amplius quippiam didicerunt iis quæ coqui intelligunt" (Kühn, tom. xiii, p. 604).

stadium, carrying it along by the impetus of its own motion, the flesh being in a state of putrefaction, but the bones still cohering, until it has been caught in the nooks of some elevated piece of ground and landed there. When such an occurrence has happened, a medical man should carefully prepare it [*i.e.*, the cadaver] for the teaching of his pupils. Sometimes, also, we see the skeleton of a robber[20] lying on a hillside, a little way off the road, who, when making an attack, has been killed by some traveller in self defence. No inhabitant of the district would order the body to be buried, but would rather, pursuing it with hate, take a pleasure in leaving it to be devoured by birds; and these having, for a couple of days, been removing the flesh, have left a dried skeleton, as it were, to anyone willing to examine it for instruction. But if no opportunity of this kind turn up, you can still avail yourself of the individual bones of dissected monkeys, having first removed the muscles; for which purpose you will select those monkeys which most closely resemble the human figure" (Kühn, tom. ii, p. 220).

One of the most important points demonstrated by Galen was the presence of blood, as distinguished from air or vital spirits, in the arteries or aorta. This he contended for by experiment and by argument. The following graphic account is quoted from Dr. Kidd's paper. It is quite a literal translation, except from being put in the third person:—

[*Blood in Aorta.*]—"There are some teachers, Galen says, who are in the habit of advancing opinions which they are not prepared, and, therefore, not inclined, to put to the test. Such was the case with a certain teacher of anatomy, who, having declared that the aorta contains no blood, and having been earnestly desired by several ardent pupils of Galen to exhibit the requisite demonstration, they themselves offering animals for the experiment, declined, after various subterfuges, to satisfy them without a suitable remuneration, on which the pupils immediately raised a subscription among themselves for the purpose, to the amount of a thousand *drachmæ* [equivalent probably to about twenty-five or thirty pounds of our money]. The professor being thus compelled to commence the

[20] In Cheselden's *Osteographia* (London, 1733) there is a fine plate, as a frontispiece, representing Galen contemplating the skeleton of a robber.

experiment, totally failed in his attempt to cut down upon the aorta, to the no small amusement of the pupils, who thereupon taking up the experiment themselves, made an opening in the thorax in the way in which they had been instructed by Galen, passed one ligature round the aorta at the part where it attaches itself to the spine, and another at its origin; and then by opening the intervening portion of the artery, showed that blood was contained in it" (Kühn, tom. ii, p. 642).

But Galen as a philosopher and logician could contend by argument on such subjects as well as by experiment. In those old times medical questions were discussed by means of all sorts of arguments and reasonings, often of the most dubious character. In dealing with such arguments of his opponents, Galen is highly sarcastic.

[*Syllogisms as to blood-vessels.*]—"But if the controversy were to go on what could they answer (were they only willing to be consistent), but that there exists no art of deduction, and that from given hypotheses *anything* can be inferred without distinction? Or, that the art indeed exists, but is not needed in clinching demonstrations? But both positions are utterly absurd. For if they were to take up the former position (as a certain fellow of shameless front once had the hardihood to do), they might then hear from us, in turn, such arguments as he heard. 'The arteries have two coats, blood is tawny, *therefore* the arteries contain not only air but blood as well.' On their laughing, I immediately added this other syllogism, 'Crows are black, swans are white, *therefore*, not air alone is contained by the arteries.' When they laughed afresh at this, I subjoined a third reasoning, 'Fire is hot, snow is cold, thou art stupid, *therefore* not air only is contained in the arteries.' For if *anything* can be inferred from given premises, and there exists no art of drawing a conclusion, what is to prevent me from arguing in this way with you? But if there be a certain art and well-considered science which teach us to discriminate in individual cases, and what can be inferred from certain premises, which man appears to you, O disciples of Erasistratus! to have more sense, he who knows no art, or knowing does not use it? or he who both knows and uses it?"—(Kühn, tom. iv, p. 727).

Galen had devoted much attention to the anatomy and physiology of the eye,[21] and also wrote on its diseases, but this last treatise is amongst the lost works (see Kühn, tom. i, Preface, pp. 194, 195). The following extracts regarding the movements of the eyeball and the commissure of the optic nerve seem specially interesting :—

[*Movements of Eyes.*]—"If, then, the eyes can be moved by our will, and if all movements of this kind are effected by muscles, it is evident that the Creator has surrounded the eye with muscles. But it is not sufficient for us to rest content with a knowledge of their utility, we must also investigate their number, taking special note of their size and situation. If, then, each eye has four movements—viz., inwards towards the nose; outwards towards the external canthus; upwards towards the eyebrows; downwards towards the cheeks—it is presumable that these movements are controlled by a precisely similar number of muscles. Thus there are two muscles at the sides (*the internal and external recti*), one in each canthus; two others the one above, the other below (*the superior and inferior recti*). The aponeuroses of all these muscles form a broad circle—a tendinous ring—which is continuous with the iris.

"As it is necessary for the eye to have also a movement of rotation, nature has provided two other muscles each situated obliquely at the centre of an eyelid. These extend from above and below towards the outer canthus (*superior and inferior obliques*). Thus by means of these muscles the eye is turned in any desired direction. There also exists at their origin another broad muscle (*suspensory or choanoid*), which stretches and protects the attachment of the soft nerve (*optic nerve*). This muscle elevates the eye and causes it to rotate a little. Indeed, this soft nerve would easily be ruptured from its liability to suffer severe concussion by any injury to the head, were it not strengthened and protected on every side."—(Rendered from Daremberg's Translation : Galien, tome i, p. 628. *Utilité des parties du corps*, x, 8. Kühn, tom. iii, p. 795).

---

[21] Otto Katz: *Die Augenheilkunde des Galenus. Erster theoretischer Teil : über Anatomie und Physiologie des Sehorgans. Inaugural-Dissertation*, Berlin, 1890. Some of the articles in J. Hirschberg's *Wörterbuch der Augenheilkunde*, Leipzig, 1887, are also of special interest in connection with Galen's work.

[*Optic nerves and commissure.*]—"Thus the sensitive nerves descend from the encephalon to the eyes (*optic nerves*), which Herophilus called *ducts*, for they alone have canals manifest to the sense of sight, which are for the purpose of giving passage to the pneuma; these nerves not only have this peculiarity which distinguishes them from other nerves, but, moreover, they arise from different parts of the brain. During their course they are united together, and afterwards divided, being separated from each other. Why, then, has not nature given their superior prolongations a common point of origin? Why having created them, the one on the right side and the other on the left, instead of taking them directly into the region of the eyes, has it caused them to curve inwardly, joining them together and uniting their ducts, thereafter causing them to enter the eyes each in the direction of its superior prolongation? In a word, instead of transposing them by sending the nerve of the right side to the left eye, and that of the left side to the right eye, nature has given to these nerves a figure very similar to χ.

"At least, from a careful dissection, one might form the opinion that these nerves are transposed, and that they pass the one over the other. This is not, however, the real state of matters. For after being brought into contact with each other in the cranium so that their ducts are united together, they immediately separate from each other, showing clearly that they are only brought together to effect a junction of their ducts."—(Rendered from Daremberg's Translation: Galien, tome i, pp. 637, 638. *Utilité des parties du corps*, x, 12. Kühn, tom. iii, p. 814).

A passage, to which Dr. A. D. Waller directed my attention, serves to show the minuteness with which Galen studied the functions of the nervous centres, and illustrates the method which he pursued by physiological experiments on living animals:—

[*Effect of transverse sections of whole or half of Spinal Cord.*]—"Moreover you have seen that transverse incisions of the whole cord deprive all parts of the body below of sensibility and of movement. . . . And you have seen in dissections that transverse incisions of the cord (from right to left or from left to right) which stop at its centre, do not paralyse all the inferior parts, but only the parts

situated directly below the incision—on the right when the right side of the cord has been cut; on the left when it is the other side." —(Kühn, tom. viii, p. 209. *De locis affectis*, iii, 14. Daremberg: Galien, tome ii, p. 579).

Further points of interest may be gathered from the following quotations from Dr. Kidd's paper:—

[*Relation of Heart and Arteries.*]—"In giving an account of an experiment intended to prove that the arteries contain blood, he says, that after having made a ligature on the femoral artery, you will observe the pulsation *between* the ligature and the heart, but not between the ligature and the extremities."—(Kühn, tom. ii, pp. 646-649).

"In another part of his works he makes the general observation that the heart is evidently the source of pulsation, since, if a ligature be made in any artery, pulsation continues in that part of the artery which is intermediate to the ligature and the heart, but ceases in that part of the artery which is intermediate to the ligature and the extremities."—(Kühn, tom. iv, p. 683).

"But how unprepared he was for the discovery of the true circulation of the blood is evident, from his confession that he is totally unable to explain why Nature, which does nothing uselessly or without design, should have made *different* vessels—namely, arteries and veins—to contain the same fluid."—(Kühn, tom. iv, p. 722).

[*Physics of Sucking from the Breast.*]—"It appears that Galen, although ignorant of the doctrine of atmospherical pressure, was acquainted with some of its practical effects. Thus, he says, if you put one end of an open tube under water and suck out the air with the other end, you will draw up the water into your mouth, and it is thus that infants extract milk from the mother's breast."—(Kühn, tom. v, p. 708).

[*Experiments on Ureters.*]—"If, he says, you open the abdomen of a living animal, and make a ligature on the ureters, you will find that no urine passes into the bladder; but after having loosened these ligatures, you will observe the bladder become gradually

distended with urine (Kühn, tom. ii, p. 36); and if, when the bladder has been distended with urine, you fix a sufficiently tight ligature on the penis, and compress the bladder even with considerable force, you will find that no urine repasses into the ureters, and for this he accounts by the oblique entrance of the ureters into the bladder, the obliquity of the entrance forming a natural valve, the action of which valve, he adds, is so perfect as to prevent the regurgitation not only of liquids, but even of air, as is proved in the common inflation of the bladder of any animal."—(Kühn, tom. iii, p. 390).

[*Recurrent Laryngeal Nerve*].—"Galen's *sixth* pair will easily be recognised as answering to the eighth pair of modern anatomy; for he says of them that although they arise from different points within the cranium, they yet become united in their exit from that cavity; that they give branches on each side to the muscles of the larynx, on which branches, if a ligature be made, or on the trunk near the carotid artery, the animal becomes dumb (Kühn, tom. ii, p. 841); that some of the branches after having entered the thorax pass up in a retrograde direction to the muscles of the larynx, and that if these branches be injured the voice of the animal is impaired though not destroyed. Galen asserts that he first discovered these branches, and, from the peculiarity of their course, gave them the name 'recurrent' (Kühn, tom. ii, pp. 841-844). The habitual accuracy of his observation is evinced when he corrects the error of those experimentalists, who, omitting to separate the contiguous nerves, in making a ligature on the carotids, supposed that the consequent loss of voice depends on the compression of those arteries, and not on the compression of the accompanying nerves" (Kühn, tom. v, pp. 266-7).

Galen on the Pulse.

Galen's strongest point in diagnosis turned on his discrimination of the different kinds of pulse. On account of his wonderful skill in this way, it was said that "Apollo prophesied by the mouth of Galen."[22] Full justice is done to him by M. Ozanam and by Sir William Broadbent in

[22] Ozanam, *La Circulation et le Pouls* (Paris, 1886), p. 21.

their treatises on the pulse. The latter has furnished a translation of a portion of the *Libellus de Pulsibus ad Tirones.*[23] The following extracts, selected from his translation, may suffice to show the way in which the author deals with the subject:—

[*Libellus de Pulsibus ad Tirones*].—"Chapter I. The heart and all the arteries pulsate with the same rhythm, so that from one you can judge of all. . . . But you could not find any arteries more convenient or better or more suitable for the pulse than those in the wrists, for they are easily visible, as there is little flesh over them, and it is not necessary to strip any part of the body of clothing for them as is necessary with many others, and they run in a straight course; and this is of no small help to the accuracy of diagnosis.

"Chapter II. The artery will seem to the touch to be distended in every dimension. There are three dimensions to every body—length, depth, and breadth.

"In an animal in a normal state of health you will find the artery quite moderately distended; but in abnormal conditions sometimes the tension is too low, sometimes too great in every dimension. Now you must remember what a normal pulse is like, and if you find an abnormal pulse of excessive breadth, you should term it 'broad'; if of excessive length, 'long'; and if of excessive depth, 'deep'; and in like manner the opposite of these 'narrow,' 'short,' and 'shallow.' And a pulse that is in all these dimensions abnormally diminished is termed 'small,' and one that is abnormally augmented 'large.' Such, then, are the varieties of pulse, as far as dimension goes.

"Chapter III. As regards special characteristics, there is swiftness and slowness. In the former case the movement is free and unrestrained, in the latter case enfeebled. These conditions you must judge by comparison with the normal.

"The strength of the pulse, or the reverse, is determined by the force with which it repels the touch; if it repels violently it is strong, if weakly the reverse.

"And there are variations in the softness or hardness of the arterial coat; it is soft when the artery appears, so to speak, flesh-like to the touch; hard when it seems dry and hard, like leather.

---

[23] Broadbent, *The Pulse* (London, 1890), pp. 6-11.

"So then you notice differences in pulses such as this at once, as you observe the movement of the artery, though they are not, however, specially characteristic of it, as were the three before mentioned.

"For the speed or slowness of the pulse depends, we said, on the rate of movement, and the strength or feebleness on the character of the pulsation, and the largeness or smallness on the length of the diastole. But the diastole is not devoid of movement, and there is no need of movement in a soft or hard body for it to be such. These four variations in pulses you will find according to the beat.

"Chapter IV. Besides these is a fifth variety depending on the pauses between the beats. For such is the term usually given by medical men to the space of time between the beats, within which the artery expands and contracts. Moreover, I think that beginners should practise themselves as though the systole could not be felt. The two terms I shall use are the *pulsation* and the *pause*. By the *pulsation* I mean the feeling the artery strike against the finger as it is expanded; by the *pause* I mean the period of quiescence between the pulsations, according to the length of which normal pulses are rapid, slow, or medium. These you will determine by the length of the pause. For a pulse is rapid when the interval of quiescence is short, slow when the interval is long. You may call it indifferently *quiescence* or *pause* between the pulsations or *systole*."[24]

Chapters V, VI, and VII deal with irregularities in their different forms. "One may be irregular in size, another in rate, another in violence, feebleness, and frequency and so on."

"Chapter VIII. The pulses are arranged as far as it is possible for one to be taken with another, one with many, many with many, and some of them have a name: for instance, the worm-like (vermiform), the ant-like (formicans), and the hectic pulses. The worm-like

---

[24] Sir William Broadbent in a note gives an explanation which is important:—"It is the individual pulsation which is here spoken of, not the pulse-rate or frequency. In his larger treatise Galen describes two pauses —one after the diastole of the vessel, the other in the systole; and it must be borne in mind that the diastole or pulsation was believed to be a more or less sudden expansion of the artery, and not, as we know it to be, a distension of the vessel by blood."

pulse is a condition in which it seems as though a worm were creeping along the artery, which is in waves of pulsation, the whole of the artery not being distended at the same time. If this takes place accompanied by a short relaxation, it is called worm-like; but if with a long interval merely wave like. The worm-like pulse, too, is readily seen to be feeble and beating quickly. But the pulse that has sunk to the extreme limits of feebleness, frequency and smallness is called ant-like, and this though it appears to be swift, is not really so.

"So, too, the pulse is termed hectic just as we apply the term to a fever, when it does not vary greatly but remains much the same continuously, being entangled and never getting free, as the whole condition is one of disease in fevers and pulses of this sort. . . .

"Let me now sum up shortly what I have been speaking of, and then proceed to the subject next in order.

"An excessive pulse is that which occurs when the artery is greatly distended in length, depth, and breadth: a pulse is long when the artery is distended only in length, broad when distended in breadth, deep when in depth. A violent pulse is one which strikes strongly against the finger; a soft gentle pulse occurs when the coat of the artery is soft. The pulse is rapid when the artery is distended in a short space of time; frequent when there is little interval; regular when each succeeding beat is the same; constant when each recurring cycle of beats is the same; a pulse that is uneven in one beat is termed irregular in one beat.

"Clearly the opposites of these would be the small, short, narrow, low, feeble, hard, slow, infrequent, irregular, inconstant. Clearly, too, there is a mean between each of the other opposites; but there is no mean between a regular and irregular, a constant and inconstant pulse; and the means between all the others are the normal pulses, but in the latter cases, the regular pulse alone is normal; the others—namely, the irregular and inconstant pulses—are abnormal."

His writings on the pulse are very extensive, and, indeed, occupy a large portion of two out of the twenty volumes of Kühn's edition. There are seven separate treatises, including a "Synopsis of his own books on the Pulse." The theoretical elaboration to which he carried his classification is seen in the following table, where he carries out his ideas of the "length,"

"breadth," and "depth"[25] of the pulse, with all the possible variations under these three headings; in a fourth column he names some of the more important combinations, the first and the last being, he says, the only distinctions previously recognised (De Pulsuum Differentiis, lib. i; Kühn, tom. viii, p. 505).

Longus.	Latus.	Altus.	Magnus.
Longus.	Latus.	Moderatus.	
Longus.	Latus.	Humilis.	
Longus.	Moderatus.	Altus.	
Longus.	Moderatus.	Moderatus.	Gracilis.
Longus.	Moderatus.	Humilis.	Gracilis.
Longus.	Angustus.	Altus.	
Longus.	Angustus.	Moderatus.	Gracilis.
Longus.	Angustus.	Humilis.	Gracilis.
Moderatus.	Latus.	Altus.	Turgidus.
Moderatus.	Latus.	Moderatus.	
Moderatus.	Latus.	Humilis.	
Moderatus.	Moderatus.	Altus.	
Moderatus.	Moderatus.	Moderatus.	Medius.
Moderatus.	Moderatus.	Humilis.	
Moderatus.	Angustus.	Altus.	
Moderatus.	Angustus.	Moderatus.	
Moderatus.	Angustus.	Humilis.	Gracilis.
Brevis.	Latus.	Altus.	Turgidus.
Brevis.	Latus.	Moderatus.	Turgidus.
Brevis.	Latus.	Humilis.	
Brevis.	Moderatus.	Altus.	
Brevis.	Moderatus.	Moderatus.	Turgidus.
Brevis.	Moderatus.	Humilis.	Turgidus.
Brevis.	Angustus.	Altus.	
Brevis.	Angustus.	Moderatus.	
Brevis.	Angustus.	Humilis.	Parvus.

[25] Sir William Broadbent says of this classification—"Deserting the path of observation, he did not see that a cylindrical tube would expand equally in all directions, and that there could not be any difference between its breadth and depth" (*The Pulse*, p. 7, footnote).

When, in addition to these twenty-seven varieties, we have variations according to time—"Celer," "Moderatus," "Tardus"[26]—and, again, all sorts of varying forms of irregularity, it is evident that refinements in nomenclature were pushed to an almost incredible extent!

The following amusing illustration of Galen's diagnostic skill in pulses shows his acuteness in other things as well as sphygmology!

[*Diagnosis of Love by the Pulse*].—"Some medical sophists, ignorant of the way in which Erasistratus discovered the love of a young man for his father's maid, in asserting that he had discovered it from feeling love pulses in the young man, allege, indeed, nothing more than anyone might say, namely, that it was found out from the pulse. I am certainly not able to say in what way Erasistratus may have made the discovery, but I will disclose in what way I did so. I was called to visit a woman [the wife of Justus] who was troubled with insomnia, and was tossing about from one position to another on a couch. On ascertaining that she was free from fever, I made some inquiries in regard to the particulars of the onset of the condition, from which I might form a notion of how the insomnia was caused. But the woman herself, if she made any response at all, made it to little purpose, showing that it was vain to question her further; at last, with averted looks, she covered herself up entirely with the bedclothes, and lay with her head turned away on a small pillow, after the manner of a person in need of sleep. Therefore I left, and from these things concluded that she was suffering from one of two things—either that she was the victim of melancholia, or that she was affected by some grief which she was unwilling to avow. Therefore I delayed till next day to examine her with greater care; and on my arrival, the first thing I heard, from a maid standing by, was that I could not see her. On my next visit I was told the same thing. I returned a third time, and the servant told me, in order that I might go away, that the woman did not wish to be disturbed. When I ascertained that on my departure she had made her toilet and resumed her accustomed

[26] Indeed, he makes out twenty-seven varieties according to this also (Kühn, tom. viii, p. 533).

ways, I went to see her next day, and in a general gossip with the maidservant I ascertained that she was clearly troubled by some distress, the nature of which I found out by chance, in the same way as I think Erasistratus also made his discovery, accidentally; for when I had made sure that she suffered from no bodily affliction, it happened that, at the same time as I was visiting her, this was confirmed by some one coming from the theatre and mentioning that he had seen Pylades dancing. Her look and colour underwent a change; the brachial pulse, which I was holding, became irregular and suddenly agitated in several ways, the sure index of mental emotion; the same thing happens in those who are contending about something. On the next day, I directed one of those who followed me, that when I went in on my visit to the woman, he was to come in shortly after, and mention that Morphus was dancing to-day. This was done, but I found no disturbance in the pulse. In a similar way, on the following day, I had taken care that the name of a third dancer should be mentioned, but there was no alteration of the pulse. On the fourth evening, I made a careful experiment. With the pulse in my hand, it was again mentioned that Pylades was the dancer; again there was the same agitation, and I concluded that the woman was in love with Pylades, a diagnosis confirmed by the repetition of the experiment on subsequent days."—(Kühn, tom. xiv, p. 630; compare also tom. xviii B, p. 40.)[27]

Galen's Diagnosis—Clinical Sketches.

The diagnosis in the case just quoted was supposed to be based on the pulse; and in a sense it was, although no great skill in sphygmology was required in the actual feeling of the woman's pulse. The following case was, likewise, supposed to be made out by the pulse; but Galen gloats over the way in which he imposed on his philosophical friend and his medical patient in thus impressing them with his skill in diagnosis from simply feeling the pulse; this, indeed, had its place in judging of the case, but, as will be gathered from the amusing narra-

[27] On the title page of the Latin edition published in Basle in 1562, this story is depicted—"Amantis Dignotio"—the woman in bed; the husband, Justus, standing by; Galen feeling the pulse; and a "Nuntius" intimating the name of the dancers.

tive, this part, although important, was trivial as compared with the acuteness of observation which utilised every accidental indication which could possibly be laid hold of. The following is rendered from Daremberg's French translation (tome ii, p. 657) :—

[*Galen's Wonderful Diagnosis of the Case of a Sicilian Physician.*] —"When I came to Rome for the first time I was greatly admired by the philosopher Glaucon on account of a similar diagnosis. Finding me on the road, he said to me that I had arrived opportunely ; then taking my hand, he said: 'We are quite near an invalid whom I have seen just now, and I wish you would come to visit him with me. He is a Sicilian physician whom you have seen a few days ago walking with me.' 'What is the cause of his illness?' I said. Placing himself at my side, he said very frankly and plainly—for he was not one to cheat or play tricks—'Gorgias and Apelas informed me yesterday that you have made diagnoses and prognoses which approach to divination rather than to the art of medicine. I desire, then, to have a proof, not of your knowledge, but of the power of the art of medicine, and to ascertain if it can furnish such an astonishing diagnosis and prognosis.' During this conversation we had arrived at the door of the patient, so that I had not been able to reply to his request, nor to tell him, what you know I often repeat, that sometimes there are, fortunately for us, indubitable signs, but that sometimes everything is doubtful, and that consequently we have to await the results of a second or a third examination. At the outer gate we met a domestic who was carrying from the sick room to the dunghill a vessel containing excrements resembling the washings of flesh—that is to say, thin and bloody fluid, a constant sign of an affection of the liver. Without appearing to have noticed anything, I went with Glaucon to the physician, and I was putting my hand to his arm, wishing to know if there was inflammation of the organ or simply atony. The patient, who was himself a physician, as I have mentioned, said that he had just returned to bed after having been at stool. 'Consider, therefore,' he added, 'that the frequency of the pulse is increased by the effort I have made in rising.' Thus he spoke, and as for me, I ascertained in the pulse the sign of inflammation. Then, seeing placed at the window a pot containing hyssop prepared with honey-

coloured water, I bethought me that the physician believed himself affected with a pleurisy, on account of feeling at the false ribs the pain which sometimes also appears there in inflammation of the liver. I thought that, as he experienced this pain, his respiration was frequent and small, and that he was tormented with short paroxysms of cough; in a word, he believed himself affected with pleurisy, and so had made a preparation of hyssop and honey water. Recognising, then, that good fortune had given me the means of raising myself in the estimation of Glaucon, I placed my hand on the false ribs on the right side of the patient, and indicating the place, I said that he suffered in this region. The patient confessed it, and Glaucon, believing that the pulse alone had sufficed for this diagnosis of the affected place, showed visible signs of admiration. To astonish him further, I added, 'If you have admitted that you suffer there, acknowledge also that you experience the necessity of coughing, and that at pretty long intervals you are seized with a short, dry cough, without expectoration.' As I said these words he coughed, by chance, exactly in the way I had indicated. Then Glaucon, astonished, and being unable to contain himself, heaped on me well-earned praise, with a loud voice. 'Do not suppose,' said I, 'that these are the only things which Art can divine regarding patients; there are others which I will mention. The patient himself will be my witness.' Then addressing him: 'When you breathe more deeply, you feel a sharper pain at the place which I have marked; you experience also weight in the right hypochonder.' At these words the patient could not restrain himself; full of admiration he joined his exclamations to those of Glaucon. Recognising the success which I had obtained on this occasion, I wished to risk a word about the twinges at the clavicle; but although knowing well that this accompanies grave inflammation of the liver, as scirrhus, I did not dare to advance this, fearing to compromise the praises which they had lavished on me. I had the idea of sliding in this remark, with precaution, and turning to the patient I said: 'Shortly, you will experience twinges at the clavicle, if you have not already felt them.' He confessed this to be the fact; and I said, looking at the patient, who was struck with astonishment, 'I will not add further to my indications than this divination; I will announce the opinion which the patient himself has formed of the disease with which he has been affected.' Glaucon said that he

did not any longer despair of this divination; and the patient, stupefied by this singular promise, gave me a piercing glance, and close attention to my words. When I had told him that he believed himself affected with a pleurisy, he acknowledged the fact, testifying his admiration; and not he only but also the servant who came to make the affusions of oil as if he had a pleurisy. Glaucon since this time conceived a high opinion of me and of the medical art, which he had esteemed but slightly before, never having found himself associated with remarkable men who were consummate masters of the art."—(Kühn, tom. viii, p. 363).[28]

A better insight into Galen's really scientific methods of diagnosis may be gained from his treatise *De Locis Affectis;* indeed, in several passages, one might almost think he was reading a modern treatise on medical diagnosis. I have selected the following extract from this treatise as to the diagnosis of urinary disorders. It is rendered from Daremberg's French translation (tome ii, p. 471).

[*Differential Diagnosis in Urinary Disorders*].—"Another kind of diagnostic is drawn from certain signs which manifest themselves when something abnormal is enclosed in a region with which it has no natural relation—for example, a stone in the kidneys or bladder, or pus in the thorax. To this variety may be referred a clot of blood, whatever may be the place where it is enclosed, or any peccant humour engendered in the body of the animal, or introduced from without. This fact has raised among many modern physicians a question, useless indeed for practical purposes in medicine, but giving rise to speculative views. They have asked themselves if such abnormal things, engendered in us, come under the category of 'affected places;' or if, no place being affected, the animal suffers solely from the presence of this unnatural cause. That such a problem is useless, as I have said, is easily recognised in considering how much diagnosis contributes to practice. Thus, suppose there is a person who has for three days passed absolutely no urine, would

[28] This story is also depicted in the title page of the Latin edition, Basle, 1562—"Hepatici Cognitio"—the patient in bed; "Glauco" standing by; Galen applying his hand to the region of the liver; and a servant is seen, through an open door, emptying a vessel into the dunghill.

we not immediately inquire in which part of the body the cause of mischief is? Is it in the kidneys, in the ureters, in the bladder, or in the urethra? Certainly we would not search in the liver, the lung, the spleen, the stomach, the heart, nor in any other part, because not one of these is a urinary organ; but if we did not know that the secretion of urine takes place first of all in the kidneys, then that the urine passes through the ureters to the bladder, and that it is evacuated from it in the manner that we have indicated in the discussions *On the Natural Faculties* (1, viii), we could not discover anything from this. It is not even enough to go this length, for it is preferable to search, among the causes announced, for what may be the cause of the retention of urine.

"Here is the method to follow in this inquiry: to inquire into all the symptoms present and past, examining for one's self the symptoms actually present, and ascertaining the past symptoms, not merely from the patient but also from the attendants (see Hippocrates, *Aphor.*, 1, i). Is there, for example, a tumour in the region called *pubic*—a tumour indicating clearly that the bladder is full to a certain extent, and that the discharge of urine is completely suppressed; is it not evident either that the force which presses the urine out is abolished, or that the passage of the urine is obstructed? But one will examine next if this force can be abolished, recollecting how the evacuation of urine is effected in healthy persons, who possess voluntary control, the muscle which surrounds the neck of the bladder ceasing to act, while the bladder itself acts. The action of the muscle depends on our will, that of the bladder is involuntary and physical. In fact we have shown in our commentaries *On the Natural Faculties*, that in almost all parts of the body there exists a faculty for separating superfluities, a faculty which all animals constantly possess, and of which they make use when hampered by these superfluities. When then this faculty has been injured, there results sometimes the affection named *ischuria*. But if you placed the patient in such a position that the neck of the bladder inclines downwards, pressing with your hands on the abnormal tumour, the urine will be expelled. If this attempt leads to no result, the idea of paralysis must be abandoned, and we must suppose that the urethra is obstructed. In fact, the paralysis of the muscle which surrounds the urethra produces not ischuria but involuntary discharge of urine."—(Kühn, tom. viii, p. 7).

The continuation of this discussion as to the differential diagnosis of retention of urine was selected by Sir William Broadbent, in his Address to the British Medical Association, as an example of how near Galen came to modern ideas in such matters.

"Suppose the patient to be a child who has previously presented symptoms of stone, watery urine charged with sandy deposits, the child continually squeezing the penis, which is flaccid or unaccountably erect; then sudden stoppage of urine takes place. It may be reasonably concluded that the stone is lodged in the neck of the bladder. Place the child on his back, the hips a good deal raised above the rest of the body; then shake him in different ways so as to make the stone fall out of the canal. After these proceedings, tell the child to try and pass his water. If the attempt is successful and the urine flows, you will be satisfied that you possess the exact diagnosis of the cause, and that, at the same time, you have found the proper treatment. Should the retention persist, you will shake him again still more forcibly; if after this it still persists, then with the catheter you will push the stone from the neck of the bladder to re-open a passage for the urine."—(Sir William Broadbent's Translation, *British Medical Journal*, 1895, vol. ii, p. 267).

Galen's recognition of jaundice as caused by snake bites is very striking as a clinical description, while his comparison of the corruption of humours due to poison with that due to disease is also interesting. The following is rendered from Daremberg's French translation (tome ii, p. 654):—

[*Jaundice from Snake Bites.*]—"One of the slaves of the Emperor [Marcus Aurelius] whose duty it was to drive away snakes, having been bitten, took for some time draughts of ordinary medicines, but as his skin changed so as to assume the colour of a leek, he came to me and narrated his accident; after having drunk *theriaca* he recovered quickly his natural colour. Physicians seek to find out if there are signs peculiar to poisoning, because they often see, without the administration of any deadly poison, that the body presents a corruption of the humours similar to that which is produced by poisons; it is not at all surprising, therefore, that there sometimes

supervenes a change in the humours, so that the whole body is affected with jaundice."—(Kühn, tom. viii, p. 355).

The quaint rendering by Gale in his translation of Galen's *Methodus Medendi, &c.* (London, 1586, p. 126), gives us the definition of inflammation which held sway for centuries,[29] and can scarcely be dispensed with even yet.

[*Inflammation.*]—"The Grecians used to call that an inflammation, which cometh with great tumour or swelling in the fleshie parte, strained and stretched forth, resisting with pulsation and dolour, hot and red."—(Kühn, tom. vii, p. 707).

The following sketch shows Galen utilising his opportunities in impressing a rich client with his skill in curing his butler; the dramatic manner in which he sent him to confront his master in alighting from his carriage, at a time when he was supposed to be confined and still dangerously affected, is very amusing.

"I was once asked by a certain rich man, who lived in the suburbs of Rome, to come and see his butler, who was in danger of losing his sight, so he said; certainly he had been suffering much pain for the last twenty days. Moreover, the physician who was appointed to look after the rich man's household belonged to the sect of Erasistrateans, and had a great abhorrence of venesection. When, therefore, I knew, having seen the patient, that he was a "full-blooded" young man, and that his eyes were not yet ulcerated, but that there was much inflammation and discharge, that the eyelids were much thickened, and that in one there were even granulations (asperitates), causing dimness of sight, and more and more pain, and all increased by the inflammation and discharge; having seen all this, and learning the whole line of treatment which their doctor had employed, I said that I could not, of course, be constantly coming to the suburb, and that it was necessary, for at least three

---

[29] "Notæ vero inflammationis sunt quatuor, rubor et tumor cum calore et dolore" (Celsus, lib. iii, 10). The definition is supposed by some to have descended from Erasistratus. See *The New Sydenham Society's Lexicon*, "Inflammation."

days, to see the man at short intervals. 'Certainly,' he said, 'you may, and I will be grateful; take the man with you to your own house in town.'

"He came about the fifth hour, and forthwith, at the first bleeding, I withdrew three pounds of blood, and made another bleeding again at the ninth hour. Having recovered wonderfully from this, the following day a certain kind of soft ointment was used, to which was added that amount of wine which we are accustomed to add in such a case. The ointment was applied under the eyelids by the point of a probe, which carried it to the highest parts. I did that first in the morning, then at the third hour, and again at the ninth. After which inunctions, he was at sunset led to the bath. Then on the following day the everted eyelids were again anointed twice; a great quantity of eye-salve, which had received the wine, being mixed with the soft ointment. Again he was bathed at evening. On the following day he went out in the morning to meet the rich man, and at the place where they are accustomed to descend from their carriages, he saluted him, with eyes open and free from all inflammation and discharge, the same man who, two days before, had not been able to see on account of the discharge and pain. Thus the matter appeared like magic, so that, wondering at the rapidity of the cure, all the others burst out with exclamations of praise, although really we had done nothing great, unless it were in comparison with the other doctor, who had perpetrated the greatest mischief on account of his dread of bleeding. . . .

"The rich man having inquired into the matter—whether or not it had been a case of magic—and having understood the whole thing, from that time forth called the Erasistratean physician a *αἱμοῤῥόβος*—a *blood-funker*."[30]—(Kühn, tom. xi, p. 299.)

A clinical picture is presented in a phrase by Galen's synonym for diabetes—*ὕδερος εἰς ἀμίδα*—rendered by Daremberg, *hydropisie dans le pot de chambre!*[31]

[30] So Dr. T. K. Chambers renders it! See his paper quoted in first footnote.

[31] Daremberg, tome ii, p. 675; Kühn, tom. viii, p. 394.

Galen as a Practitioner.—Bloodletting.

The theoretical principles underlying Galen's practice have been already alluded to, but it may interest some to learn that as far back as Galen we have a clear enunciation of the principle of cure *per similia* as well as *per contraria;* many of the public foolishly think that the former principle was originated last century, although universally recognised long before.

[*Per similia et per contraria.*]—"Ac si præter naturam sit quod indicet, contrarium id semper indicare: sin secundum naturam se habeat non contrarium sed simile."—(Kühn, tom. x, p. 775).

On the great question of bloodletting, the following extracts given by Dr. T. K. Chambers in his racy paper, mentioned in the first footnote, may serve, along with the last quotation, to indicate Galen's ideas and practice in this respect.

[*Galen's Cases bearing on Bloodletting.*]—"When I first came to Rome, I found some physicians who were so averse to venesection, that sometimes, when a man was scarce able to breathe from congestion, they would not employ this treatment. There was a woman, just under 21, who after suppression of the catamenia, had a flushed face, with loose cough and dyspnœa, whom they treated by bandaging the limbs and depriving her entirely of food: but they would neither open a vein nor let me do so. And on account of their being acquaintances of the woman's household and senior practitioners, more faith was had in their opinion than in mine. I made no more attempts to persuade them to bleed, but I asked if there was any objection to set up a derivation of blood to the uterus by means of drugs calculated for that object. And when they consented, I immediately got the midwife, usually employed by the patient, and desired her to use them. But she said she had already applied remedies of this sort at the proper time—namely, when the catamenia might normally be expected; and she named the drugs—all of tried efficacy—which she had administered to the woman, so that no one could suppose that it was from the inefficiency of these medicines that relief had failed to be given. When I heard this, and, moreover, that the menses had been already suppressed for months, I had

another consultation with the medical men to try and persuade them to bleed. When they refused, I wondered why, if they were anxious to evacuate the superfluous blood through the uterus by opening the mouths of the numerous veins there, yet they should think the evacuation injurious when it was made by opening any other vein. They stated that superfluous blood could be evacuated by fasting alone, without having recourse to treatment such as I proposed. So I held my tongue and took my leave, in despair about the woman, on account of the cough and dyspnœa. I expected she would either spit blood from the chest, or from the lungs by the bursting of a blood-vessel, or would have laryngitis, or pleurisy, or pneumonia; and my hope was, as a choice of evils, that she would have pleurisy, for I was afraid in case of laryngitis and pneumonia, that the risk would be imminent, and that in case of hæmoptysis, the occurrence of it would be fatal. And such turned out to be the result. For, as she was coughing very violently, blood was thrown up. And now some non-professional persons complained of the doctors who opposed the bleeding, and hopes were expressed that now at least, though not before, they would be shamed into permitting the treatment. When they would not give way, but desired the bandages round the limbs to be tightened, and persisted in the attempt at derivation towards the uterus, and continuing the starvation, I took my leave, persuaded that I could effect nothing on account of the gentlemen's age and celebrity. And very shortly afterwards the patient was seized with an incurable difficulty of breathing and died.

"Under the hands of the same physicians who opposed bleeding, there also died several patients with laryngitis. And there was another patient, too, who through the whole winter had been living high, and taking no exercise, and in the spring was so red in the eyes and face as a man kept for a long time with his head on the ground and his legs in the air, and he died suffocated after five days' illness.

"Next there was a fourth patient—a woman—who was ill at the same time that the catamenia were suddenly stopped, whom these enemies to bleeding brought to death's door. They kept her for three days absolutely without food, because she had a continued fever; on the fourth day, they gave her the smallest possible quantity in slops; and on the fifth, they ordered fasting again, and then she got violently delirious, jumped up, and ran screaming about out of doors, and the attendants had great difficulty in restraining

her violence. She, however, was saved by nature, through a copious effusion of blood from the nostrils.

"This was a circumstance which should excite our admiration, and at the same time teach us what a powerful influence bloodletting has in such affections, for immediately after the hæmorrhage from the nostrils the woman was freed from all her symptoms.

"Now previously to this I had shunned having any communication with the medical men, guessing what they would say against the use of venesection. But since it was so very clear to all that the woman's life was saved by the evacuation of blood, I recalled to their memory the fatal cases—expressing an opinion that perhaps those, too, would have been saved if they had been bled. And I gave sundry reasons for it. But these gentlemen involved the matter in a maze of words, and twisting the argument round and round, and up and down, came to no conclusion. However, they at last ended by taking refuge in Erasistratus, stating that it was 'shown by him in his *First Book on Loss of Blood*, that it was better to apply ligatures to the limbs than to bleed.'"—(Kühn, tom. xi, p. 187).

In concluding this section, I will quote the *résumé* which Dr. Chambers ventures to give of Galen's guiding principles on this great question of treatment.

[*Dr. Chambers' résumé of Galen's Rules as to Bleeding.*]—1. "That you are not to treat the disease, but the man; that you are to judge of the propriety, the amount, and necessity for repetition of bloodletting, by the individual symptoms exhibited in each case, and not by the nomenclature.

2. "That you are to observe, also, the natural constitution of the patient—*e.g.*, the extremes of life, youth and old age, cause bloodletting to be badly borne. Certain races, such as the soft-fleshed Celtic nations, do not stand it.

3. "That you also take note of epidemic influences—*e.g.*, not to bleed much in the dog days (in Italy); and in moist warm weather, when, of course, septic poisons are most rife.

4. "That you are not to mistake physiological changes for morbid; such, for example, as the fulness of pulse which accompanies the first stage of digestion, for permanent fulness.

5. "That they are to take blood from vessels which communicate directly (κατὰ ἴξιν) with the chief seat of inflammation.

6. "That often, in spite of apparent or real general debility, it is desirable to take blood; since the benefit to the locally affected part, and the consequent benefit to the system, compensates for the depletion."

Galen's Use of Medicines—Theriaca.

Regarding the use of special medicines by Galen, I must refer to Gasquet's article and Berendes' book quoted in the first footnote. The latter deals in an elaborate manner with the pharmacy of the ancients.

Galen's wide travels had made him acquainted with medicinal plants in various parts of the world, as the following extract shows:—

"The doctor should be acquainted with all plants, or at least with the majority and those most used. The species, or if it is preferred, the different sorts are trees, bushes, herbs, thorns, and shrubs. Whoever is able to distinguish them from their very young state until their full growth, will find them in many parts of the world. Thus, I myself have found plants in various districts of Italy which those who had only seen them in the dry state were unable to recognise, either during their growth or afterwards. Every vendor of salves knows the plants and fruits which are brought here from Crete: but not one knows that many of them grow in the neighbourhood of Rome. Therefore, no one thinks of looking for them when the time of ripening has arrived."—(Translated in Puschmann's *History of Medical Education*, p. 107; Kühn, tom. xiv, p. 30.)

He had even learned from a practical man, at the price of a good fee, the mysteries of adulteration of drugs, and how to avoid this.[32]

Amongst medicines of that time no more celebrated article existed in the materia medica than Theriaca. Our English word "treacle" is derived from this owing to a superficial resemblance between the appearance of the two. Theriaca is derived from the Greek *θηριακά φάρμακα*, antidotes against the bites of wild beasts—from *θηρίον* and *θήρ*, a wild beast.

[32] Kühn, tom. xii, p. 216.

Originally devised as an antidote to such bites, it came to be used, in certain of its forms, as an antidote to other poisonings,[33] to which important people were specially liable; and from this the term came to be applied to remedies regarded as antidotal to disease (compare the passage already quoted on jaundice from snake bites). Opium was probably the most important ingredient in many, if not all, the forms of theriaca, and powdered snakes may be regarded as the most striking—a remarkable way of applying the doctrine of cure *per similia!* Galen informs us that not a few, and among them the Emperor Marcus Aurelius himself, took a daily dose of theriaca as a precaution or antidote.[34]

We have in our library two special memoirs on theriaca—one by Heberden in 1745, and a recent one by Bernhardt (*La Thériaque: étude Historique et Pharmacologique*, Paris, 1893). According to the latter, the formula of Galen comprises seventy-four substances. The amount of opium in 4 grammes of this theriaca is estimated as containing 0·10 centigramme of crude opium. Up till quite recent times this extraordinary compound appeared in official pharmacopœias. The French Codex which I show you is dated 1866; the ingredients number 57, including not only "opium de Smyrne," but also "vipères sèches"!

As to the use of medicinal substances in the cure of disease, Galen, as becomes his training, takes a philosophical view. He refers with approval to the sentiments of Herophilus in this connection:—

"For if you say that medicines are nothing in themselves, you say well; they are indeed nothing unless they are properly used. If, on the other hand, you say that medicines are as the very hands of

---

[33] "Omnino a lethalibus et deleteriis appellatis medicamentis erit securus et immunis."—(Kühn, tom. xiv, p. 3.) More strictly, Alexipharmaca were antidotes to poisons; Theriaca the antidote to bites of wild beasts.—(Kühn, tom. xv, p. 279.)

[34] *Ad Pisonem de Theriaca*, Kühn, tom. xiv, p. 216; see also tom. xiv, p. 3.

the gods, here again you say well. For they assist greatly, especially if he who employs them is experienced in a rational method, and in addition is prudent by nature."—(Kühn, tom. xii, p. 966.)

Galen as a Surgeon.

The Hippocratic treatises were notable for their importance in connection with surgery quite as much as medicine. One would have expected that Galen, with his profound knowledge of osteology and anatomy, and with his experience in experimental physiology, would have been specially drawn to surgical practice. Early in his career, indeed, he had charge of the gladiators in his native town, as we saw in the abstract of chronology. He had then a good opinion of his success in this charge. But the specialising of surgery had already begun in Rome by the time of Celsus, and when Galen went there he had to conform to the customs of the place, and he did as the Romans did in this respect. In a book on dislocations of the humerus he speaks of seeing a rare form "once in Asia and four times in Rome;"[35] but, apart from eye cases, he seems to have almost limited himself to the practice of medicine. That this arose from no want of inclination, and from no want of confidence in his own powers, is evident from the following quaint extract from Gale's translation. It is in the sixth book of the *Therapeuticon*, where, speaking of wounds of the head, Galen says:—

"I had also gone about to trie the like waie of curing, if I had continuallie remained in Asia, but seeing I have bidde at Rome, I doe followe the manner of the citie, committing the greatest part of such works to those whom they call chirurgions."—(Gale's translation, London, 1586, p. 124.)

Galen as a Teacher—Profession in Rome.

Galen was distinguished as a teacher as well as a practitioner; then, as now, reputation as a teacher assisted in gaining practice, perhaps even more so at that time, as the

[35] Kühn, tom. xviii, p. 346.

lectures and the displays of surgical operations seem to have been of a more public nature. Puschmann says of Galen:—

"In order to become known there [in Rome] he gave public lectures on the structure and functions of the human body. The interest of the subject, and the practical knowledge of the lecturer, soon attracted a numerous audience composed of representatives of the most distinguished circles of the capital. Amongst his hearers were men in influential positions, such as the philosophers Eudemus and Alexander of Damascus, the prefect Sergius, the consuls Boëthus and Severus, who afterwards mounted the throne, and Barbarus the uncle of the Emperor Lucius.[36] In this way Galen succeeded, within a short time, in obtaining a profitable medical practice."—(*History of Medical Education*, London, 1891, p. 95.)

In the quotations already given about tying the aorta, we have a glimpse of his influence on his pupils in their ardour in trying to convict of incompetence a rival teacher who had different views from their master. We likewise get an indication of his clinical teaching in connection with the case of "Amantis Dignotio," for he there makes use as a messenger of one of his pupils, apparently—"ex iis qui sequebantur me"—showing that they visited patients with him at their own homes, and received in this way their clinical instruction.[37]

Of the state of the profession generally in Rome, Galen draws a dreadful picture; but as he himself poses as the victim of the envy and persecution of the physicians there, it is perhaps fair to discount somewhat his retaliation on them in this abusive description. One can easily gather, even from the quotations already given, that Galen had, as a French biographer phrases it, "un amour-propre excessif;" and his acrid disputes, with syllogisms embellished by such phrases as "tu stupidus es" as one of the premises, might naturally

[36] Some of these are figured and named, as viewing Galen's dissection of an animal, on the title page of the Latin edition, Basle, 1562.

[37] Clinical instruction seems also to have been given in *Tabernæ Medicæ* or *Iatreia*, the construction of which was arranged to secure good light and ventilation. (See Puschmann, *History of Medical Education*, London, 1891, p. 111; also Galen, Kühn, tom. xviii B, pp. 678, 674, &c.)

set the profession there against him; indeed, his position in Rome was probably only rendered safe by the influence of Marcus Aurelius and other potentates.

Galen says of physicians in Rome:—

[*Medical Profession in Rome*].—"They will say or do anything to curry favour with the multitude; they will also flatter and favour; in the towns they will daily salute wealthy and influential persons, walk alongside of them, take them to their houses, give banquets, and behave themselves like buffoons. Others, not only in this manner, but also by the gaudiness of their clothing and their rings, by the splendour of their silver vases and by the troops of followers accompanying them, endeavour to dazzle fools and show that they are persons of tremendous importance and men to be imitated"—(Kühn, tom. xiv, p. 600.)

In another passage he draws a comparison between the members of the medical profession and robbers, the sole difference being, he says, that the former perpetrate their crimes in the towns and the latter in the mountains.[38]

Notwithstanding the hard lines which had, according to himself, fallen to his lot through the hatred and envy of the profession in Rome, Galen seems to have had at least one good fee, received from the consul Boëthus for attendance on his wife; he sent him 400 "aurei," equivalent, we may say, to 400 English guineas. Indeed, so far as the value of that coin can be estimated, the "balance of exchange" seems to have been in favour of Galen, for it is quoted in the dictionary as £1, 1s. 1½d.; but these "aurei" evidently acquired a very special additional value in Galen's eyes, as the rumour of them increased the envy of his fellow practitioners, and added to his praise![39]

[38] "Sola hac re a latronibus differunt, quod in urbe, non in montibus facinora sua perpetrent."—(Kühn, tom. xiv, p. 622.)

[39] ["Boëthi uxorem uteri profluvio laborantem praeter spem aliorum sanat] . . . quadrigentos aureos ad me misit, auxitque generosorum horum medicorum invidiam, inde quod me laudibus extolleret."—(Kühn, tom. xiv, p. 647.)

Editions of Galen.

The editions of Galen's works which I place before you are amongst the best and the most useful. We have not in this library a copy of the celebrated "Aldine" edition, with the Greek text only, published in five folio volumes, at Venice, in 1525. I show, however, the one published at Basle in 1538, also in five folio volumes, with the Greek text alone. It may interest some to know that the initial letters in this edition are supposed to have been carved by Holbein, who was in Basle about this time, and whose work lay very much in this direction. Although Galen practised his profession for many years in Rome, he wrote exclusively in Greek, as, indeed, it was common at that time for philosophers there to do.

The Latin translation, in three large folio volumes now before you, was published in Basle in 1562; it contains a preface and life by the learned Conrad Gesner. On the title page of the first volume there are some curious and interesting illustrations of certain passages in Galen's experience.

The edition which for many years now has been principally referred to is the Greek and Latin text of Kühn, consisting of twenty octavo volumes, with 1,000 pages or thereby in each, published in Leipzig, 1821-1833. There are really twenty-two volumes, two being double; the first volume is largely taken up with a life of Galen and a bibliography in great detail; and the last volume is occupied by an index. It is to this edition that references are here given.

The edition by Renatus Charterius in thirteen folio volumes (Paris, 1679) was much referred to before Kühn's appeared. It contains the works of both Hippocrates and Galen, and has a Latin translation as well as the Greek text; also a life, and many useful notes. The plan of arranging the commentaries of Galen along with the Hippocratic treatises makes it rather cumbrous for reference.

A French translation by Daremberg, in two volumes, entitled *Œuvres Anatomiques, Physiologiques et Médicales*

de Galien (Paris, 1854-56), is of very special value, so far as it extends. Its title page bears that it is preceded by an introduction containing a bibliographical, literary, and scientific study by the editor. In the preface this study is announced as about to follow (constituting a third volume); but it never appeared, and it is to be feared the MS. is lost.—(Laboulbène, *Gazette des Hôpitaux*, 1882, p. 1187.)

Of English translations, there are none except those by Gale—*Certaine Workes of Galens called Methodus Medendi*, beginning with "The Third Booke of Galen, called in Greeke θεραπευτικον; in Latine, Methodus Medendi," and going on to the "sixt;" also "Claudus Galeni de Tumoribus preter naturam;" and "An Epitome upon Galen's three bookes of naturall Faculties." This edition of Galen was published in London in 1586; the bulk of the volume, however, consists of a translation from Vigo.

John Redman Coxe—*The writings of Hippocrates and Galen epitomised from the Original Latin translations* (Philadelphia, 1846.) As regards Galen, pp. 463 to 681 are all we have, affording little more than an index to his voluminous writings; even of this, much is spoiled by a constant railing against the credit given to Harvey, and against English physicians for ignoring Galen's claims as a discoverer of the circulation of the blood.

MEDICAL BIBLIOGRAPHY AND MEDICAL EDUCATION: DR. ROBERT WATT'S LIBRARY FOR HIS MEDICAL STUDENTS IN 1812.

MEDICAL BIBLIOGRAPHY AND MEDICAL EDUCATION: DR. ROBERT WATT'S LIBRARY FOR HIS MEDICAL STUDENTS IN 1812.

By James Finlayson, M.D., *Physician to the Glasgow Western Infirmary, and to the Royal Hospital for Sick Children; Honorary Librarian to the Faculty of Physicians and Surgeons, Glasgow.*

When I wrote "An Account of the Life and Works of Dr. Robert Watt, Author of the 'Bibliotheca Britannica' (London, 1897)," I stated that I had been unable to find, anywhere, a copy of his medical catalogue.[1] A few months ago I saw this little book, bound up with a miscellaneous lot of pamphlets, in the catalogue of a second-hand bookseller in Glasgow, and I secured it at once for the Faculty Library.

The method pursued by the great bibliographer in teaching medicine is worthy of notice, even at the present day. He says:

"The reading of the student is too often confined to systems, and to compilations, which are generally the works of men of no experience, or of men writing under the influence of preconceived opinions. By the first, materials of little value are as readily selected as those of real importance; while by the last, only such facts are recorded as go to support a particular theory. To obtain correct views in medicine, it is necessary to have recourse to original authors, to such as write from actual observation, who have seen and treated the diseases they describe.

"Many students, however, are neither possessed of such works, nor have they access to them. To remedy this defect, the present plan of establishing a library is undertaken, and it is hoped that it will meet the approbation of those for whose benefit it is intended.

"In my lectures on the Practice of Medicine, after considering the history and treatment of each disease, I give a list of the best

[1] "Catalogue of Medical Books, for the use of Students attending Lectures, on the Principles and Practice of Medicine, with an Address to Medical Students on the best method of prosecuting their studies, by Robert Watt, M.D., Member of the Faculty of Physicians and Surgeons of Glasgow, Member of the London Medical and Chirurgical Society, etc., and Lecturer on the Principles and Practice of Medicine in Glasgow," 8vo, Glasgow, 1812, pp. 69.

authors who have written on the subject, and I now put it in your power to peruse these authors, to examine their facts and opinions, and to draw your own conclusions" (pp. 5, 6).

He goes on to combat the idea that ancient literature is useless.

"An idea has too generally prevailed, that there is little useful knowledge to be derived except from writers of the present day. . . . After having suffered ourselves to be more or less diverted from the true path of inquiry, by the dreams of enthusiasts and the reveries of system-mongers, we are glad to resume our march in the road which Hippocrates and Sydenham traversed with such signal caution and success. By comparing the practice of the ancients with modern improvements, we shall learn to appreciate justly the value of the latter. By marking the errors into which our predecessors have fallen, we shall be enabled to pursue, more steadily, the right method of research" (p. 7).

Watt's catalogue represents, for its time, an admirable collection of books in all departments of medicine. It consists of fifty-one pages, and contains over a thousand entries. The ancient literature of the Greeks and Arabians is well represented, and Celsus and Cælius Aurelianus, of course, are there too. Paracelsus, Van Helmont, Stahl, Hoffmann, de Haen, Boerhaave, Van Swieten, Gaubius, etc., are all there. Works then recent are also entered. Thus we have Baillie's "Morbid Anatomy" (1807), as well as Bonetus and Morgagni; the last, as in many other cases, is in an English translation. Books by Glasgow physicians and surgeons are, as might be expected, well represented; mention may be made of the two important works of Allan Burns, and the various volumes by his brother, Professor John Burns; Dr. Badham on "Bronchitis" (to use the name he invented [1]); Dr. John Riddell on "Fever"; Dr. Richard Millar on the "History of Medicine"; Dr. John Moore's "Medical Sketches"; Cullen's well-known works; and Dr. Watt's own book on "Diabetes" (his book on "Chin Cough" was not published till later). Peter Lowe's "Chyrurgerie" is represented by the 3rd edition (1634). The collection included many volumes of medical journals also. Dr. Watt points out, in a note, that the deficiencies in his list are chiefly as regards books of the last ten or fifteen years, a defect which he was trying to remedy. In addition to the books, he mentions that he had a collection of about 1000 theses, from Edinburgh, Glasgow, and the Continent, which were all available for reference. He further states that "manuscript catalogues, arranged alphabetically according to the author's names and the subjects treated, may be seen in the library, and will be printed as soon as the collection

[1] In the "New English Dictionary," Dr. Murray gives priority in the use of the word "Bronchitis" to P. Frank, 1812, noting Badham's book as 1814; he seems, however, to have overlooked Badham's first edition, which was issued in 1808.

is completed." It has been stated, indeed, that this classification, by authors and subjects, of his own medical library suggested the idea of his great "Bibliotheca Britannica."

Although referring to a somewhat different matter, it may likewise be quoted here, that "Dr. Watt has also made some progress in forming a museum for illustrating the different parts of the animal economy in health and disease"; and he announces that in the meantime, by the kindness of his friend and neighbour, Mr. Allan Burns, he could show from his museum "specimens of many of the most remarkable organic affections."

This method of medical teaching, by the use of a library, does not seem to have been entirely new in Glasgow. When the celebrated Cullen was an apprentice to Mr. Paisley, a Glasgow surgeon, he found the library of his master very useful for himself, as it was unusually good; and when Cullen began his distinguished career as a teacher of medicine in Glasgow, he was able to arrange for his pupils having access to this collection of books. Mr. Paisley, as "Bibliothecarius" to the Faculty of Physicians and Surgeons in Glasgow, was no doubt impressed with the value of having direct access to authoritative books, and with rare generosity he laid his library open to Cullen's students.

The question arises, Might not modern teachers of medicine do well to imitate Watt's method? No doubt, since Watt's time, a great improvement has occurred as regards text-books, which are now produced, at but little cost to the student, by those of high standing and great practical experience; but now, as then, reference to cyclopædic works, to original memoirs, and to special articles in journals, is constantly required for any adequate presentation of certain subjects. Of course, some teachers may say that they present as much of this as is good for the student's stage of education, and some even bring before the students for their inspection copies of great works which have left their impress on medicine. In such matters, however, just as in clinical work, it is of the utmost importance that a student should learn how to go about these inquiries himself; a little found out for himself, as to the literature or history of a disease, counts for more than a great deal told him by a teacher. By the former method, what is supplied is information; by the latter, the student obtains education.

How seldom has a young practitioner even a remote idea of how to prosecute an inquiry into the literature of any subject in which he may be interested, and how apt he is, through such ignorance, to think his case "unique," or his observation original! No doubt these difficulties might be lessened by some regular demonstrations in a fairly good medical library, in which the practical use of catalogues, indexes, and books of reference could be shown. Such demonstrations, just as clinical demonstrations, would have their value; but personal investigation (carried on, it

may be, in a tentative or blundering manner) is the only way to acquire any real mastery of the situation, either with books or patients.

Professor Osler of Baltimore tells me that, in the case of a senior student, he may give such a subject as Graves's disease, and request him, in two or three weeks, to bring up a very short verbal account of the literature or history of the subject, explaining who Graves was, and where and when he described the affection; and in the same way as regards Basedow. Owing to their proximity to the great medical library in Washington, with its index-catalogue, his students have no doubt certain advantages. The information thus acquired, and communicated, it may be, from one student to another, is apt to be better assimilated than if it came from the professor. The student thus finds his way to original sources of information, and learns much in the process in addition to what he is searching for.

In my own cliniques I have not gone so far or so systematically in this direction as Professor Osler, but I have sometimes made a demonstration of the leading books, in various languages, on children's diseases, or physiognomic diagnosis, for example, placing them on the table for personal examination. Occasionally, I make a student read aloud from the original treatise the description (for example) given by Sydenham of Chorea Sancti Viti; and I have given Hecker's book to a clinical clerk, and asked him to bring up by and by a short verbal report of the differences or relationships of the dance of St. John, the dance of St. Guy, and Sydenham's chorea, when such a case was under his care.

I think, however, it is not often that this can be done in the Scottish schools of medicine. The continual complaint still is, that the student has no time for such work. He is so much belectured that he has not the necessary time to prepare a few minutes' lecture of his own! Professor Osler's students have the enormous advantage that they have *no* systematic lectures on medicine at all, either from him or any one else; all his teaching is by clinical work, or such methods as those referred to. Why should he lecture systematically, when he has done his best in this way by his printed book on medicine?

In Scotland, our medical professors in the universities were formerly tied down by a hard-and-fast ordinance, so that they had to give a hundred systematic lectures in winter and fifty in summer, whether they thought this wise or not. By the new ordinances they were liberated; but no sooner were they free than they seem to have voluntarily bound themselves with the old shackles, with the result that matters are practically unchanged in this respect. The new ordinances ordain only a time limit (five months and two and a half months) for each entire course, laying down no rule as to the number of lectures. The General Medical Council, on which the Scottish Universities are so ably

represented, went further: after prolonged discussion, some years ago, they recommended that *systematic lectures should not be given oftener than thrice a week.* So far as the Scottish Universities are concerned, this is a dead letter. Till the student's time is liberated, how can he study? How can he work in laboratories, wards, or libraries? How can he learn the business of his life? In point of fact, he has to learn most of it after his graduation.

No doubt lecturing has advantages of a kind. A system under which the student can give back to the professor, at the examination board, not only the special views but the *ipsissima verba* of the professor, as taken down by dictation, may result in a wonderful percentage of passes and a remarkably high standard of marks! Such a method of lecturing, however, is beneath contempt, and its true value would no doubt appear at any really independent examination.

Even when the professor aims at a higher style of lecturing, his selection of subjects, and the aspects of them taken up, afford indications to the student, which he highly appreciates, in view of the examination being conducted by his professor. Passing this examination is but too often the single aim of the student in his work; anything different from the professor's notions is apt to be regarded as useless or worse.

The question here introduced (no doubt somewhat episodically) is one of urgent importance. In other parts of the kingdom, notably in London and the English university schools, the responsible authorities are alive to the necessity of practical work superseding to a large extent the traditional lecturing system. A succession of brilliant teachers, for two or three generations—not yet quite extinct—has blinded the Scottish Universities to the needs of the times and to the revolution wrought by cheap printing. Practical work and instruction in laboratories, wards, and dispensaries are now the really urgent matters which reading, lecturing, or even demonstrations cannot supersede; but with systematic lectures five days a week the time and energy of the student are used up, and the power or even the desire of learning anything beyond what his professor tells him is apt to be lost. In some schools, indeed, it has been reckoned dangerous to know anything else!

Untrammelled by traditions, the Johns Hopkins University has abolished systematic lectures on medicine. Is it too much to ask the Scottish Universities, under their new ordinances, to conform to the recommendations of the General Medical Council, on which they are so fully and so ably represented?